# GAS JOURNAL, APRIL 17, 1946

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## POTENTIAL AND ACHIEVEMENT

LAST month gas undertakings took much more coal than they have taken before. The quantity was 488,000 tons compared with 437,000 tons the year before. Electricity took an increase of more or less the same amount—566,000 tons compared with 479,000 tons. Steel jumped up from 198,000 tons to the figure of 200,000 tons, and engineering went from 99,000 tons to 101,000 tons. These figures were revealed in a grave statement by Mr. Shinwell on Thursday last, when he painted an extremely gloomy picture of what is going to happen in the winter of 1946/7. Stocks of coal in this country are well down to the extent of millions of tons. Naturally we shall be asked to save coal throughout the summer months, and this we think will not be very difficult then, but if we have no supply at all during these months it will be rather difficult for us to help the Minister of Fuel and Power during the next winter.

We now have more new words with which to cope. In regard to the coal industry there are "optants" and "ballotees." We take it that the optants are people who, non-desirous of entering the Forces, wish to go down the mine, and that the ballotees are those who were previously called "Bevin boys." Last November there was an enquiry about optants and ballotees which showed that 32,000 men had entered the industry from training centres in both categories, and that 8,000 of them had done no work at all in the mines during the four weeks from their enlistment into this national service. Naturally the human factor enters into this, and it is most interesting to know that absenteeism was 100% higher among the optants and ballotees than among the regular miners who have done so much for us in the past. What is the answer to this question? Mr. Emmanuel Shinwell suggests that these naughty boys should go back into the Army, and he has admitted that his difficulties are such that he has been in consultation with the Minister of Labour on this most difficult question. "Action will be taken," said Mr. Shinwell; "there is no doubt about that, and it will be soon. Cases have been reported of optants who put in one day a week at the pits and for the rest of the time are engaged in other business. Far better put them in the Forces, though I am sorry the Forces have to accept men like that."

## OPINION

SOME short time ago there was a conference held in Doncaster, at which the Yorkshire section of the Institute of Fuel and the National Smoke Abatement Society joined together to discuss mutual problems concerned with the abolition or partial elimination of smoke. We have in the past attended many meetings concerned with this, and at each meeting during the last 25 years or so we have been impressed by the sincere desire of everybody concerned with national welfare to eliminate smoke. The columns of the "JOURNAL" have been largely devoted to the aim of smoke abolition. We have seen a certain amount of progress in this direction, but not a very great deal. It was singularly fitting that at this conference at Doncaster woman's opinion should be voiced so thoroughly. The discussion was inaugurated by a series of Papers dealing with technical progress in smoke abatement. The Chairman at the convention was Professor D. T. A. Townend, who at the moment occupies many positions, including that of Professor at the University of Leeds, Director of B.C.U.R.A., and, incidentally, among other activities, Chairman of the Yorkshire section of the Institute of Fuel.

There were Papers by Dr. H. A. Fells, Dr. J. E. Garside, and Mr. W. A. Wordley. Discussion on these contributions to better essential amenities was opened by Professor Townend, who was followed by the General Secretary of the National Smoke Abatement Society, Mr. Arnold Marsh, who suggested that, regarding the whole matter objectively, when the coal fire was first introduced there was repugnance towards it, and that it gained favour in this country only because of sheer economic necessity when wood, the then traditional fuel, became scarce and expensive. This takes us back into the 17th century. Generation after generation continued to use coal in inefficient appliances, and the practice became surrounded by an aura of sentiment which, in his opinion, had been difficult to break down, but which, also in his view, would be broken down from other causes. Another suggestion which Mr. Marsh put forward was that an Eskimo living in an igloo for a long period with nothing but candles to warm himself or give him light, would give to those candles the same sentiment and the same affection that we in this country have for so long devoted to the open coal fire. Antimacassars have gone, and even affection or sentiment can crack.

Let us turn to the woman's viewpoint. Here we come to one or two expressions of opinion at the meeting to which we have referred. "We have had too much cheap woman labour not only in underpaid service in the past, but also in unpaid women in their homes, who have merely been drudges because of inadequate water supply and mediaeval appliances." The lady who made these comments then went on to consider the variability of our climate—a variability which is the source of much comment in buses or in trains. She said that she could be baked in the morning and frozen in the afternoon; that sometimes there were mild days in the winter and cold ones in the summer; irrespective of this, she was determined that the nation should have hot water on tap just as we have cold water, which we hope will come true. The lady in question is also a tremendous believer in background heating.

Then came a man's view. In his contribution to the discussion he pointed out—and there can be no denial to his statement—that the Ministry of Home Security became somewhat panicked, and decreed that all chimneys should make as much smoke as possible in a vain endeavour to prevent air attacks. At this time fuel efficiency was swept away as distinct from the chimneys in which the coal was burned. Fuel ran short, and fuel was supplied in a very different manner from any period in the whole of the British history, and that state of affairs obviously has continued. Again we have shale, bats, ash, according to the will of the Ministry of Fuel and Power, which, during this period advocating stringent fuel economy, must realize that no fuel of the type can be economized properly because of the draught necessary in any domestic appliance to make that fuel burnable at all.

Let us return to another suggestion put forward at the meeting by another lady contributor. We have had a full report of the discussion at the meeting and have been greatly impressed by the optimism and enthusiasm of woman's opinion, and here we will quote: "We are going to have no difficulty whatever with the generation who are now in their twenties. They have made up their minds, not only the women, but the men; thousands of them are never going to cope with the domestic work that the previous generation has put up with,

and it is the duty of industry to give the young people what they want." Industry, of course, has to provide the coming generation with what the coming generation desires. Perhaps the words of a male contributor may affect the future situation. He said without hesitation that few domestic fire grates intended for burning coal made any pretence of being other than more or less decorated cavities where a fire might be made without danger to the house or its occupiers.

We have, of course, had the report of the Fuel and Power Advisory Council appointed by the Ministry of Fuel and Power in 1944, to which we made reference in last week's "JOURNAL." This Council stated that it should be the target of a national domestic fuel policy to secure that the 50,000 tons of bituminous coal now burned with a working efficiency of 20% should be replaced in 20 years by smokeless solid fuel or by bituminous coal burned smokelessly or by gas or electricity with an average coal economy efficiency of not less than 40%. The carbonizing industries have suffered badly during the war partly from air attack, and also because they have been quite unable to replace plant and maintain existing plant in a state anything approaching what the Gas Industry thinks is perfect condition, and the Gas Industry has very definite views upon what perfect condition entails. At the moment carbonizing plant is unable to cope with increasing load which in the interests of the community ought to be met, and in our opinion it will be some considerable time before this load can be dealt with adequately. The Industry is willing to co-operate, but asks for assistance in certain ways; it is prepared, we are sure, to place the knowledge at its disposal freely before any Ministry. The Industry asks for Ministerial action.

## Personal

Mr. J. L. WILSON, Watford District Manager of the Watford and St. Albans Gas Company since 1936, has been appointed District Engineer over the whole of the Company's area.

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Mr. H. F. SNOW has joined William Edgar & Son, Ltd., as Gas Industry representative on behalf both of the parent Company and its subsidiary, the Ufix Boiler Co., Ltd.

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Mr. ERIC CULSHAW, formerly of the Blackburn Gas Department, has been appointed by the Parkinson Stove Co., Ltd., as Assistant to Mr. R. Wilson, who for many years has represented the Company in Lancashire, Cheshire, North Wales, and part of Yorkshire.

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Mr. R. E. P. HOSKIN, now on the Staff of the Oxford & District Gas Company, has been appointed an Assistant Engineer to the Peterborough Gas Company. He received his early training under Mr. H. D. Madden, of Cardiff.

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Mr. W. H. SHELLEY, Fittings Superintendent with the Walsall Gas Department, has retired after 46 years' service. When he joined the undertaking in 1900 there were less than 10,000 consumers, but to-day, despite the competition of electricity, there are 30,000 gas users. A founder member of the local branch of N.A.L.G.O. Mr. Shelley has been a member of the Midlands District Gas Salesmen's Circle since its formation, and was Chairman in 1933–1934.

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Mr. F. BACKHOUSE, who has been in the Gas Industry for 24 years, formerly with the Parkinson Stove Company, Ltd., and latterly on the central administration of the United Kingdom Gas Corporation, where he returned after three years in the R.A.F.V.R., has been appointed a Director of Scientific Kitchens, Ltd., Manchester, and takes up his duties next month. The Company has been working in close liaison with many gas undertakings in connexion with modern kitchen units, of which the "Lancastrian Suite" is an example.

**The Home Planning Exhibition,** a pre-view of which was described in the "JOURNAL" of Mar. 27, was opened to the public at Lewis's, Manchester, on April 10. The exhibition, which comprises not only scientifically designed kitchens but a model house, shows how the Gas Industry with a combined gas and coke service can supply all the heating, water heating, and cooking facilities necessary to maintain a high standard of home comfort, and at the same time provide a completely smokeless service. Designed and organized by the British Gas Council, the exhibition is constructed on mobile lines, and after a run of just under a month at Manchester it will move on to other provincial towns.

## Diary

April 25.—Women's Gas Council: Executive Committee, Gas Industry House, 1 p.m.

April 26.—Manchester District Association of Gas Engineers: Annual Meeting; Presidential Address, G. E. Currier.

April 26.—London and Southern District Junior Gas Association: "Power Plant and Machinery for Exhausting and Boosting of Gas," L. J. Clark, Gas Industry House, 7 p.m.

April 26.—Southern Association of Gas Engineers and Managers (Eastern District): "The Place of the Gas Industry in the National Fuel Economy," Dr. G. E. Foxwell, Gas Industry House, 2.30 p.m.

April 27.—Manchester and District Junior Gas Association: Visit to Liverpool; Discussion on Report of the Gas Installations Committee (Ministry of Works Post-War Building Studies, No. 6), to be opened by R. J. Rogers, Chairman of the Committee.

April 27.—Scottish Junior Gas Association (Eastern District): Visit to a Colliery of the Fife Coal Co., Ltd.

April 30.—Institute of Fuel: Whole Day Conference on Waste Heat Recovery, Burlington House, Piccadilly.

May 2.—Midland Junior Gas Association: Annual General Meeting, followed by an Address by a member of the Gas Research Board.

May 8.—North-Western Fuel Luncheon Club: "Fuels and Nationalization," Colonel W. A. Bristowe, Engineers' Club, Albert Square, Manchester, 12.30 for 12.45 p.m.

May 9–10.—Wales and Monmouthshire Association of Gas Engineers and Managers: Annual Meeting, Prestatyn. Presidential Address, O. P. Cronshaw.

## Nationalization and the Gas Industry

In our issue last week we recorded the resolution of the Scottish Burghs Convention which met in Edinburgh and opposed the nationalization of the Gas Industry as not being in the best interests of the consumer. This report on page 590 of our issue of April 10 brought fairly well up to date our record of the conclusions arrived at by local authorities, and also of the opinions expressed by chairmen of gas undertakings, to which we have referred in the issues of the "JOURNAL" of March 6 and 20 and April 3.

Continuing the comments made at Gas Company meetings we record those of the Chairman of the Southampton Gaslight and Coke Company, Brigadier **E. M. Jack,** C.B., C.M.G., D.S.O., D.L., who remarked that the Heyworth Committee appointed by the late Coalition Government to report on the Gas Industry recommended the compulsory purchase of all gas undertakings, and the division of the country into 10 regions. The Industry, he said, strongly disagreed with the recommendation for compulsory purchase and with many other points in the report. The present Government had not yet adopted the report, but were pledged to nationalization, and had notified the Industry that the question was not open to discussion. The British Gas Council, he added, was opposed to nationalization, deeming it both unnecessary and undesirable, and being convinced that not the slightest benefit could accrue therefrom to consumers, shareholders, or employees. The welfare of these three bodies was the first concern, and the Directors of his own Company would do their utmost to protect the interests of all concerned.

Speaking at a meeting of the Leamington Priors Gas Company, Dr. **Harold Mason,** M.B., J.P., said that the Directors of his Company had always maintained that the administration of the public gas supply service under conditions of private enterprise coupled with statutory controls upon area of supply, price, rates of dividends, quality of gas and accurate measurement, represented the most progressive form of organization and the one most likely to ensure the maximum benefit to the community. The Directors of the Leamington Priors Gas Company, he said, felt that the Industry should have been consulted in greater measure than it had been, and they supported the British Gas Council in its appeal to the Government to postpone any plans for nationalization for two to three years, a period admitted by Cabinet Ministers to be critical for the economic life of the country, and during which there is an urgent necessity for maximum production. "Your Directors," he added, "emphasize that in accepting the dictum of the Government they do not sacrifice their principles, or in any way modify the views they have expressed."

**The Forty-First Annual Meeting** of the Wales and Monmouthshire Association of Gas Engineers and Managers will be held at the Residential Golf House, Prestatyn, North Wales, on May 9 and 10. Mr. O. P. Cronshaw (Rhyl) will deliver his Presidential Address at the business meeting on the morning of May 9, and in the afternoon Dr. S. R. Illingworth will give a Lecture on "Retort Conditions and their Influence on the Nature and Products of Carbonization." A social evening and dance will complete the first day's programme, and the second day will be devoted to the Dean and Upjohn Cup golf competitions, a Snowdonia motor tour, and a dinner, at which the golf cups will be presented.

# North British Association

The Spring Meeting of the North British Association of Gas Managers was held at Coatbridge on April 12, under the Presidency of Mr. T. S. Lockhart (Rothesay), an abstract of whose Presidential Address appears in other pages of this issue. We shall refer to the meeting at greater length in a subsequent issue.

Arrangements were made on the previous day for guests and members of the Association to inspect the coke oven and by-product plant of Baird & Scottish Steel, Ltd., Gartsherrie Iron Works. Guides conducted the parties, first, to the siding, where truck tippers dealt with the incoming coal, and belt conveyors passed the coal through the various processes of blending and hammer mill crushing to the storage hoppers adjacent to the "W.D." ovens. The discharge and charging of the ovens were witnessed, after which the parties were shown the exhausting, gas boosting, and steam raising plant. Other processes, including the manufacture of sulphate of ammonia, were inspected. The plant is one of the most modern in the country, and was constructed during the war to meet the heavy demands for furnace coke in the production of steel.

Messrs. Robert Dempster & Sons, of Elland, were responsible for a three-lift spirally guided holder of 750,000 cu.ft. capacity, in steel tank 110 ft. 6 in. diameter by 30 ft. 6 in. deep. There is also in course of erection by the same contractors a waterless (M.A.N. type) holder 122 ft. 2¾ in. across corners of 20-sided polygon by 188 ft. 7¾ in. high, with 5 cwt. internal and 10 cwt. external lift, 42-in. gas inlet and outlet pipe, with hydraulic and electrically operated valves, and 10 sets of electrically driven pumps in 5 duplicate sets.

Coatbridge Gas Company takes a supply of gas from the plant, as do the Glasgow Corporation Gas Department, who have a purifying and compressor station on an adjacent site. There the plant includes a single-lift spirally guided holder of 100,000 cu.ft. delivering capacity and 8 cast-iron purifiers, 30 ft. square and 10 ft. deep, with a nominal capacity of 8 million cu.ft. a day. Fittings include 24-in. single Weck's valves and hydraulic check valves and connexions, one main pre-heater, 2 sets of apparatus for lifting the covers and handling the oxide, all on steel substructure. Holder and purifier plant were built by Messrs. Robert Dempster.

The visitors were afterwards conveyed to industrial plants in the neighbourhood, including a Tube Works of Messrs. Stewarts & Lloyds, where the coke oven gas is used.

# Nails of War

"For want of a nail a shoe was lost, for want of a shoe a horse was lost—" and so on runs the old adage, to demonstrate that even the smallest piece of equipment is vital to the success of a military operation. Whether in the old days when a few hundred soldiers decided the fate of empires in a fifty-acre field between sunrise and evening, or in the clash of modern mechanized forces across continent, sky, and ocean, the metaphoric nail must be there, fitted with accuracy into its appointed place.

As the years have unfolded, "poetic" nails have become somewhat complicated, and only those possessing technical skill and productive ability are able to forge them.

When "the blast of war sounded in our ears" the Horstmann Gear Company, Ltd., of Bath, was early called to battle.

Navy and Air Force had wide uses for those delicate mechanisms for the production of which the Newbridge plant was peculiarly fitted; the designs came from technical sources, but a high percentage of production and development was carried out in the Bath factory.

During the Battle of Britain the "Few" who flew the Spitfires and Hurricanes were equipped with a piece of wireless apparatus which they called "Pip Squeak," and many a brave man and precious machine was saved by its use.

When milling around the sky fighting Messerschmidts the pilot had no time to twiddle knobs of wireless sets to find the correct frequency for his communication, and it was of vital importance that his base should know where he was. Horstmann's made the apparatus whereby, without any manual control, a signal was transmitted for 15 seconds each minute from a flight of aircraft, which, being received by three ground stations, could be plotted to show the course and position of the aircraft minute by minute during an operation. Delicate clock mechanism was the principle upon which the apparatus functioned, delicate yet robust, for although Radar has now superseded this method of "position fixing," it was during those critical days in 1940 when the balance trembled, that the Horstmann-made "Contactor" played its most important part.

But it was not enough that base should know his movements; the pilot zooming past the last burning enemy pulled out into an uncharted sky and must himself ascertain his position—and more. Perhaps his machine was damaged, perhaps petrol ran low, perhaps the weather changed. He must know what action to take. By his side was a comfortable little box with four push-buttons. Press one and he was in contact with his base, another and he could talk with the weather people, a third gave his landing facilities, and the fourth, "D" for Darkie, dealt with his emergencies. The brain of all this reposed behind him—the S.D.U. Selector Driving Unit, another product of Newbridge Works which kept unfailing guard, electrical this time, a dozen leads, fine cut gear-wheels, tiny springs, tight contacts.

### Bomber Pilot.

Before the bomber pilot is the night-flying panel. And there sits the Turn and Bank Indicator—another Horstmann product—an ingenious instrument. Its case is airtight, and air being exhausted by pumps on the engines is replaced through a tiny jet, where it impinges on vanes cut in a finely poised gyroscope wheel, spinning it at high speed to give it the gyroscopic action which keeps a pointer fixed, no matter what evolution the aircraft, and with it the case of the T.I., performs. Thus the pilot knows his rate of turn, while the movement of a pendulum coupled to another needle in the same instrument indicates any side slip which may take place during a turn. Not only bombers, but all aircraft, including gliders, carrying blind flying instruments, were fitted with this Turn Indicator, which were delivered in their thousands from Horstmann's.

### The "Astro" Compass.

This instrument, a Hortsmann product, was invaluable in magnetic storms when everything electrical went a bit funny.

When an aeroplane is fitted with two instrument panels, all the readings have to be duplicated, including engine revs. Horstmann's made a little gear box which takes one drive from the engine, passes it through a set of gears and delivers synchronized drives to two rev. counters. The second little box gives a two to one reduction to the input drive. The Horstmann clocks were used throughout the war by the Meteorological branch of the R.A.F.

### Help For The Navy.

One aid to victory at sea was the Asdic Submarine Detector, located beneath the warship's hull. This apparatus sent out sound signals which, impinging on some object, were reflected back and picked up on a receiver, the time lag indicating that object's distance. So sensitive was the Asdic that it could detect a shoal of fish or the disturbance caused by a ship's wake.

The sound was beamed along a channel, and sweeps of two degrees could be made by rotating the instrument. It was highly important that no matter how much the ship changed course, the Asdic Transmitter was stabilized in Azimuth—in other words, maintained a true bearing. Horstmann's supplied an electrical differential gear fed by two small motors to accomplish this task. One of these motors, operated by the compass circuits, drove a system of brushes over a segmented slip ring rotated by the second small motor, which was itself driven by the transmitter training system.

In a neutral position the brushes bear on insulated segments and the training circuits controlled by this system are broken. Any motion, either of the transmitter or the compass, will carry the brushes on to "live" segments; the training circuits will be energized and the transmitter rotated until brushes and insulated segments are again opposite one another.

The foregoing are examples only of Hortsmann's war work.

# South Wales Coal Reserves

The Regional Survey Committee on the South Wales coalfield, which was composed of colliery owners, managers, trade unionists, and research and survey scientists, has issued its report, showing that the reserves of workable coal in existing and projected colliery undertakings in the area are approximately 5,500,000,000 tons, and an additional reserve of workable coal of probably 3,000,000,000 tons exists in areas not at present in lease. From the coalfield as a whole the 1938 output can be maintained for at least 100 years. The reserves of both coking and gas coals are ample also for the next 100 years, and any apparent shortage has been due entirely to the fact that they are being used for other purposes. But its production and its exports have seriously declined. Exports have almost ceased.

In South Wales, as in most of the older coalfields, the second half of the last century was a period of rapid expansion, which continued till 1913, when the annual output was almost 57,000,000 tons. The disturbing influences of the first great war caused a rapid decline, and in 1920 the annual output had fallen to 46,000,000 tons, and in 1933 to 34,000,000 tons. During the recent war a further rapid decline started in 1940, and by 1944 the output had touched the very low level of 22,500,000 tons.

This variation in the share of South Wales in the national output has been largely due to the expansion and decline of the export trade. For many years up to 1939 roughly 40% of the coal exported from Great Britain was supplied by South Wales. Since then the export trade has almost disappeared, and in 1944 the total foreign shipments (cargoes and bunkers) amounted to only 1,600,000 tons.

The increase in productivity achieved by mechanization has been less in South Wales than in other areas. A considerable increase in the scale of mechanization is essential, and this calls for the fullest co-operation of managements and workmen.

In order to produce the estimated 1949 output of the coalfield 22,000 more men than are at present employed will be required—14,000 of them workers at the coal face. To enable the existing collieries to work to full capacity a further 16,000 (including 9,000 coal-face workers) must be obtained, and if contemplated developments are to be carried out a still further 18,000 workpeople will be wanted.

## London Juniors Visit Watson House

Over 100 members of the London and Southern District Junior Gas Association visited Watson House on April 10 as the guests of the Gas Light and Coke Company, and saw for themselves a great deal of the research and training activities undertaken by many of their own colleagues. The President, Mr. L. W. Andrew, is himself in charge of the space-heating laboratory at Watson House, and several past Presidents and other members were "at home" to the visitors.

During the war Watson House was to a large extent shrouded in secrecy. Much of the available space was requisitioned by the Fleet Air Arm, and only recently has it been possible to resume training on anything like normal lines. Research, also largely diverted to essential wartime needs, is also getting back to peacetime conditions, but the pre-war aim of always having some long term work in progress in every laboratory is temporarily hindered by the large amount of shorter term work which has to be done in connexion with the examination of the new appliances so urgently needed for the rehousing programme. Thus in all the domestic departments were seen new appliances of all kinds, with special emphasis on unit construction. In the industrial laboratories too there was a great deal of new work in hand.

Although Watson House escaped major air raid damage parts of the premises were put out of action, and some of the lecture rooms are still not fit for use. Training is, however, proceeding vigorously and valuable work is being done in providing refresher courses for returning ex-service men.

Dr. H. Hollings, Controller of Research, presiding at a luncheon which preceded the tour of inspection, welcomed the members on behalf of the Governor and Directors of the Company, and said that Mr. Sylvester, who was making good progress in his recovery from his recent illness and hoped to be back on duty in a few days, had taken a great personal interest in all the arrangements made for the Association during Mr. Andrew's year of office as President. They were, he said, very proud of their laboratories at Watson House, and his only regret was that they could not show the visitors more of the long-term work which, before the war, was intended to proceed continuously in the various departments, but which had been held up by the more pressing examination of appliances for new houses.

Mr. Andrew, in acknowledging the welcome on behalf of the Association, thanked Dr. Hollings, Mr. Dieterichs, and his colleagues at Watson House for their support of the Association.

After the inspection the visitors re-assembled for tea, at the close of which a vote of thanks was accorded to the Company on the proposition of Mr. G. G. Warne (Vice-President), seconded by Mr. C. A. Deas.

## Newcastle's New Holder

Members of the North of England Gas Managers' Association spent an interesting afternoon on April 5 in inspecting the 3,000,000 cu.ft. gasholder in course of erection at South Gosforth. The outing was quite informal. Conducted by Mr. E. Crowther, General Manager and Engineer of the Newcastle-upon-Tyne and Gateshead Gas Company, officials of the Company and of Messrs. George Wimpey & Co., Ltd., the contractors for the tank, the members made a complete inspection of the holder, which is to serve the growing northern and eastern suburbs of the city. Tea, without speechmaking, was later served on the site.

The holder is of electrically welded steel, spiral-guided, in three lifts (204, 207, and 210 ft. in diameter), with provision for a fourth lift, in a tank of reinforced concrete in permanent brickwork shell shuttering, with a diameter of 216 ft., and an inside depth of 31 ft. 9 in. The design was governed by two major factors, the nature of the subsoil, and a limitation placed by Parliament on the height of the holder when fully inflated—110 ft. maximum above the surrounding ground level. The actual height of the holder above the tank coping when full is 96 ft. The weights of the lifts are : Inner, 456 tons; middle, 208 tons; outer, 228 tons; and the pressures are: Inner lift, 5.6 in. W.G.; middle, 8.3 in.; outer, 10.9 in. Features of interest include the use of water overflow and return ducts in all cups; provision of interior drains to remove rainwater from the crown; dipping points to enable the depth of water in each cup to be measured; and the use of self-adjusting carriage rollers with spring washers.

The 30-in. diameter inlet and outlet pipes are spaced 90° apart, and the outlet is controlled by a Bryan Donkin automatic valve which closes before the holder can over-fill and re-opens as the holder falls. Suitable siphonage arrangements have been made at each of the two pipe pits. Gas will be admitted to the holder from either of two sources. A 10-in. main has been taken out of the Company's north-bound high-pressure system, and will deliver gas into the holder through a Reynolds governor of the same size. In addition a booster will be installed either to increase the holder pressure bearing upon the low-pressure governors, or to inspirate gas into the holder from the general trunk mains of the district during off-peak hours. Two low-pressure governors are to be provided, one of 24 in. serving a main of the same size which will feed the south-east district and (through an 18-in. branch) supplement the south-west district; and the other an 18-in. governor feeding the north-west district.

For anti-freezing purposes the possibility of using submerged electric heating cables in the cups is being considered. From cooling curves taken on other holders it has been estimated that each cup would require a 40 kW. supply to ensure against freezing at times when 20° of frost is experienced. The tank is effectively insulated by its embankment and by being sunk into the ground, and as it will contain over 5,000,000 gall. of water it can be kept from freezing by a circulating system of electric pumps, with little if any addition of heat.

The tank was designed by F. C. Construction Co., Ltd., Derby, and built by George Wimpey & Co., Ltd. The contractors for the holder are the Oxley Engineering Co., Ltd., of Leeds, who designed the structure in collaboration with the engineering staff of the Gas Company.

## Another Secret Revealed

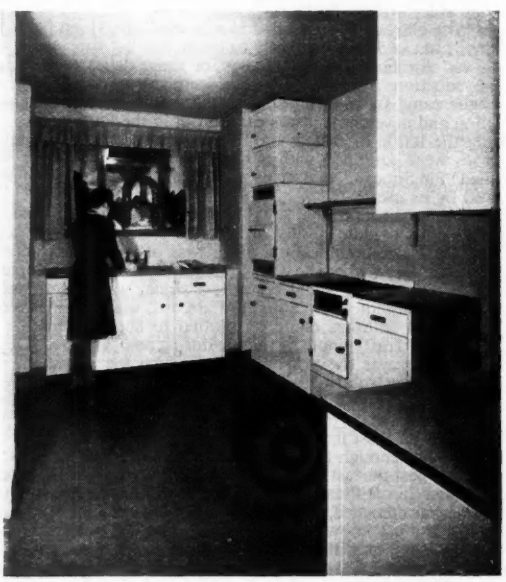
A novel wartime duty for a "Broomwade" air compressor is described in the April number of the *Broomwade News Bulletin*. Very few people were aware that within a short distance of the Houses of Parliament a huge underground citadel was constructed in secret. The general public thought that a site for a gasholder was being prepared, but in fact this huge shelter was gradually taking shape. It had numerous rooms, and was complete with its own power plant and air-conditioning system, a radio station, kitchen, and artesian well for the water supply. The Premier and the "V.I.P.'s" could have lived there for three weeks in completely self-contained security if necessary had the invasion of this country materialized. For the vital duty of raising water from the artesian well "a Broomwade" air compressor was chosen.

## Two New Dumpers

Two new machines, the 10S and the 10B, have been added to the Muir-Hill range of dumpers. Hitherto such machines have been restricted to use on private property, as their construction has not complied fully with the legal requirements for vehicles on the public highway, but both the new machines can take to the road when required. In the 10B model the driver's position is reversible, the dumper being driven steering wheel first on the road, and body first when in action.

Apart from the advantage of road usability, the machines are of entirely new design and incorporate a transmission layout having a two-stage drive. The differential is in the first stage and the final drive is by spur gears. Wheel hub flanges are integral with the axle shafts, and the entire transmission casing, together with the heavy frame, forms a unit of great strength and rigidity. The gear-box is of the constant-mesh type and gives three forward speeds—*i.e.*, for road use, and one reverse. The 10B model is in reverse when driven body forward, in the usual dumper manner. The maximum road speed is given at 15 m.p.h., and the gear ratios provided have been chosen for maximum all-round performance.

The makers, E. Boydell & Co., Ltd., of Old Trafford, Manchester, 16, state that other new machines are in course of development.



*An all-white kitchen was a feature of the recent Urmston Town and Country Planning Exhibition. The layout was prepared by the Stretford Gas Board in co-operation with Radiation Ltd., and based on plans accepted by the Urban District Council.*

# Coal, Brains, and Ingenuity

## An Address* by Dr. E. V. EVANS

THIS old country of ours is just out of the operating theatre after a serious operation. I am not sure that it has yet regained consciousness. Whether this is so or not, it is a fact that the patient is still critically, though not dangerously, ill. If you telephone to the House of Commons, or the office of the Cabinet, or to the ministry for this or for that, or to any other hospital where the patient is receiving treatment, you will get the ward sister's stereotyped answer that the patient is doing as well as can be expected.

In this critical illness the stage is certainly not set for a rapid recovery of the patient. All manner of complications and temporary relapses occur. We have only to pick up the morning newspaper, or listen to the radio news, or even to read Hansard, to realize how sick is the world generally as well as ourselves, and how serious are the complications that tend to presage a slow recovery.

We must, however, not become disconsolate, and must continue to face problems squarely as we have faced far greater problems during the last six years.

My excuse in speaking to you to-day is that in common with you all I am associated with the fuel industry. It is unnecessary to remind you that the adequate development of our industry is a major essential for the recovery of our patient.

One of our problems is to make this known throughout the country. Fuel has always been one of the prime necessities of life, but until some major catastrophe causes dislocation of fuel supplies, the public is prone to forget that life—especially life in large towns and cities—is impossible without fuel. Fuel is essential for the transport of persons and merchandize, for water supply, for transport and cooking of food, for operating docks and factories, for heating offices and homes, for the heating of water, and for a thousand and one purposes. The public must also realize that the performance of all these operations in an effective and efficient manner plays an immense part in the national economy.

I do not propose to dwell upon the need for public appreciation of our task, for we ourselves have some awkward problems to face before we can see clearly ahead.

For example, it may generally be said that, while one half of the world is wondering whether our present civilization will come to an end through shortage of fuel, the other half is wondering whether the end will come through a surfeit of energy arising from misapplication of discoveries in atomic physics.

The truly remarkable advance of scientific knowledge in the last half century has entirely changed our ideas of the physical universe, and to-day the student of the physical sciences is no longer regarded as a queer fellow with a useless and unprofitable hobby, but as a man who may some day be "hot" news on the front page of the Press. We who are in industry realize that the scientific worker in his laboratory is a partner in the scheme of things, and the scientist himself is to-day realizing that, even though he may be engaged in an abstract search for knowledge without any purpose of its application, he nevertheless is one with the professional engineers, the applied chemist, or the applied physicist, and shares responsibility for the application of his discoveries to the service or dis-service of mankind.

It is a tragedy, which we dare not afford to re-enact, that the most rapid application of scientific knowledge to practical ends has occurred during the two major wars which have marred this half century of scientific progress.

### Design for Peace

At the conclusion of the first of these wars the Government inaugurated the Department of Scientific and Industrial Research in an endeavour to promote the application of science to peaceful industry with the same completeness that had been applied to the business of destruction. Here, at the end of the second war, we are faced with the same desire and the same opportunity, though, I hope, seeing the issue more clearly.

It has been a grand thing that individual units of great industries have combined to study, through their own research associations, those basic problems which are common to all of them. Some of the items on the programme of such associations are concerned with long-term effort, with exploration intended to give guidance to the distant future. Other items are concerned with urgent and pressing problems of the moment, but, as I see it, this type of organization, which started at the end of the first war, and has so greatly extended its scope, is lacking in two respects.

Let us remind ourselves that the purpose of applied science is the betterment of the material conditions of mankind (and this is a broad definition that covers the development of great export business). It does not follow that success in this direction is best reached by providing a continuous stream of novelties in ever increasing volume. There are those who promise a new world made out of plastics or the light metal alloys, or by the agency of new forms of concentrated nourishment, or new synthetic fibres for our clothing. It is very good indeed that all these things should be available, but it is a mistake to imagine that the new is necessarily the best for the consumer. I believe that scientific research must give increasing attention to the real needs of the public and to the most appropriate way of meeting those needs, having regard to the resources of the community and the wishes of the individual. It means a rather different kind of market research; one in which the interests of the consumer are put first and the underlying motive is service to the consumer; not the maximum development of the productive capacity of a particular branch of industry.

Change and novelty there must be, but progress, if it is to avoid disaster, demands balance. I consider it an important responsibility of those directing the application of new ideas to see that the requisite balance is maintained.

The second deficiency which I see is the excessive time-lag in the application of scientific knowledge—at least for peaceful purposes. This disquieting feature is becoming widely recognized, and the Department of Scientific and Industrial Research is to-day lending a sympathetic ear to those who advocate greater assistance for the costly stages of development through the pilot plant and the experimental product. Even so, Government assistance can never be adequate, nor is it desirable that industry should look to public funds for all its needs in development. I believe that in a world which is crying out for goods of every kind, there is room for industries to show the same willingness to co-operate in developmental work as they have shown in co-operating over the earlier stage of scientific research. The products and processes which the future will demand require a scale of experiment so vast that only collaboration or the formation of very large industrial units will suffice to carry the tasks to completion.

### The Value of Coal

May I illustrate my point by reference to some of the projects which I see open in my particular branch of the fuel industry—that branch which practises the processing of coal by carbonization and gasification. The production of town gas by the Gas Industry is carried out to-day in plant which is most carefully designed in detail, but operating mainly processes which, in principle, are little different from those which Murdoch practised in 1800. The fact that the process of carbonization has continued and expanded to so great an extent is the best possible tribute to its value. In this respect the contribution of the undertaking under the direction of Sir Frederick West has merited and is meriting the admiration of the Gas Industry. Again, it does not follow that an entirely new method of treating coal by, for example, carbonization in closed externally heated vessels under high pressure is better than the old. It is our duty, however, to examine most carefully how far existing processes will serve the needs of the future and how far new processes will be required.

The carbonization of coal makes available one-quarter of the thermal value of the coal in gaseous form, some 5 per cent. in liquid form and some 50 per cent. as coke. In the years immediately ahead, coke has a very large part to play in bringing about the abolition of smoke in our large towns, but the public demands ever higher standards of service, and to give these standards with a solid fuel is likely to require appliances more complex in design, and consumer service of a much higher order than in the past. When the cost of these is taken into account, solid fuel may no longer be cheap. Moreover, we have been told and indeed we know without being told, that the day of cheap coal is past. Equally, the day of plentiful coal supplies has been left behind. In the future it will be essential for us to regard coal as a raw material of value, to be treated by such processes as will yield the maximum quantity of the most valuable forms of fuel or chemical products.

Modern chemical engineering permits us to employ, in large-scale plant, ranges of temperature and pressure wider than those which have hitherto been exploited in coal processing. The Gas Research Board is studying methods of coal treatment which involve the liquefaction of gases and the treatment of coal under pressures of several atmospheres. The main objective is to obtain far more than 25% of the thermal value in the form of gas, but it is certain that arising from this work there will be interesting possibilities for the formation of other products.

There may well be in such processes the source of home-produced liquid fuel. The chemical processing of coal is likely to recover much of the sulphur which at present is put into the atmosphere of Great Britain every year. If such processes develop, the quantity of fixed nitrogen recovered will complicate still further the ammonia market if we do not, in good time, find useful ways of applying this valuable material in new directions.

*Given at a meeting of the North Western Fuel Luncheon Club, Manchester, April 10.

If gas is produced in plant which operates under a pressure of several atmospheres, it may well give an entirely different aspect to the long-distance transmission of gas. We may find ultimately that it is less costly to process coal at the pithead and supply fuel to towns through high pressure gas-pipe lines than to move the solid coal from the pit to the user.

If the Gas Industry is to aim, as I believe it must aim, at being the supplier of cheap and convenient fuel for all categories of user, it must recognize the inevitability of peak demands and decide upon the proper methods of supplying them. They may involve the storage of liquefied gases, or the use of gas-making plant in off-peak periods for chemical synthesis.

The possibilities are manifold, and once again it will need the most careful judgment and discrimination to select those best suited to achieve the desired ends. I do not wish to convey to you that existing types of gas-making plants are out of date. This is certainly not the case, and gas undertakings contemplating extension of their plant have to-day the choice of excellently designed installations.

I am sure you will be disappointed if I do not comment on the possibility that all this work may be rendered completely out of date by the discovery of means to release nuclear energy. If that release should take place in anger or irresponsibly, it will, of course, destroy all our hopes; but if it is successfully developed as a source of energy in the service of man, it will cause us to modify our research and development programmes.

### Atomic Energy

Many warnings have been given against irresponsible expectations that the availability of unlimited supplies of energy will mean energy which costs little or nothing. I would point out that the energy in the winds, in the tides and in great rivers costs nothing, but it costs a great deal to make that energy available for use. One has only to read the published account of the American development of nuclear energy to realize that a plant of modest power output is likely to involve engineering works of tremendous magnitude, and to require safety precautions far beyond those to which industry is accustomed.

Perhaps no clearer warning can be given than the words used recently by Sir John Anderson, speaking at the Royal Society of Arts: "What it comes to is this: the prospect of the effective or economic industrial application of atomic energy is still quite remote. There is nothing in the work so far carried out in America, Canada or here, vast though the scale has been, which would justify a firm conclusion that the industrial application of atomic energy will be realized in the near future."

It may, of course, happen that the speed of practical development is increased by some discovery of a nature yet hidden from us.

But, whatever the more distant future may hold, dreams, however magnificent, will not absolve us from our duty to use and to develop the limited coal and oil reserves of the world. Particularly to us in Great Britain is this duty a pressing one. We know full well that we cannot hope to obtain from this island of ours enough of the necessities of life, certainly not both necessities and luxuries. Much must be bought from overseas, and this can only be done by purchasing the things we lack with the things we possess. The four real possessions of this country are coal, iron, brains, and ingenuity.

Britain's coal resources will not benefit us if we hoard the many more than they will if we waste them. They must be spent, and spent wisely, and upon our wisdom will depend the future welfare of the people of Britain.

In conclusion, may I return to my opening theme. This old country of ours is recovering from a great sickness. At times it looked as though the patient were "going under," but he came through. Now, during convalescence and the road to recovery, we of the fuel industries must never forget or underestimate the immense contribution that we can make.

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## House Plans Exhibition

Spacious planning, built-in wardrobes and cupboards, frost-proof plumbing, and the use of modern equipment and materials are among the features in the exhibition of plans, photographs, and models of permanent houses opened by the Lord Mayor of Manchester at Manchester on April 12. These represent the results of a national competition organized by the House-building Industries' Standing Committee, with the co-operation of the Ministries of Health and Works and the Royal Institute of British Architects, to evolve the best of the smaller type of permanent brick-built house.

Twenty-seven designs were selected by panels of judges on which women's organizations were strongly represented. Building was put in hand immediately, and demonstration pairs of houses have already been completed and opened to the public at Hayes, Eastcote, and Walsall. Included in the exhibition are plans and models of three pairs which are nearing completion at Sale, Wythenshaw, and Handforth. These were chosen from a great number of designs by three adjudication panels—local, Ministry of Works, and a Central Panel sitting in London.

The exhibition will remain open until May 4, when it will move to Liverpool.

## A National Pitch Committee

In the annual report of the Association of Tar Distillers for the year ended December, 1945, mention is made of an agreement to form a National Pitch Committee on the lines of the National Creosote Committee. Through this Committee 145,000 tons of pitch were shipped to Europe for S.H.A.E.F. In addition to this, supplies were exported to France and Belgium through ordinary commercial channels. The demand for pitch for home uses rose steeply towards the end of 1945, and such was the demand that a system of programming had to be introduced co-operatively with the National Creosote Committee and the National Pitch Committee.

The year 1945 saw the control of toluene transferred from the Ministry of Supply to the Ministry of Fuel and Power ,and the Association has co-operated closely with the Ministry on all questions dealing with benzole and toluole. The report goes on to record that early in the year a deputation of French tar interests visited England, and was in close consultation with the Association with special reference to the supply of crude and refined tar to France. Following this visit a deputation from the Association went to France, and collaboration was continued. As a result of this work an Anglo-French standing committee was formed to maintain discussions on matters of common interest.

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## R. & J. Dempster's War Work

The war record of R. & J. Dempster, Ltd., Gas Plant Works Manchester, is one of which the firm and its employees may be proud. The Company normally manufactures gas-works and chemical plant used in the condensing, purifying, washing, and storage of coal gas, and the recovery of by-products, and even under the stress of war many of these items had to continue in production to maintain vital gas supplies. New plant had to be manufactured to satisfy the high priority needs of the new war industries, and existing plant required to be reconditioned, extended, or, in many cases, partially replaced or patched-up to make good the damage suffered as the result of enemy action.

This, however, was not sufficient, and the Company undertook on behalf of the leading Government Departments additional contracts for the production of equipment of an offensive or defensive character. The secrecy with which many contracts were surrounded at the time of production, and for long afterwards, was such that in many instances even the employees actually engaged in producing them were kept in ignorance of their true purpose. This at times gave rise to awkward situations in the works, and there were instances when some of the employees asked for their release "so that they could get a job elsewhere on War Work." Such difficulties were overcome, and the work in hand continued to progress according to plan.

Apart from normal products the firm, either as direct contractors, or as sub-contractors in association with others, produced complete units or parts of such equipment as Bailey bridge parts and base plates, boiler equipment for power-houses for Russia, bolted petrol tanks of 312, 2,000 and 10,000 barrel capacity ("Pluto" parts), boom defence buoys, buoyancy cans ("Lily" units), cradles for hydrogen cylinders, cylindrical oil tanks, depth charges, fabricated jigs for aircraft construction, float sweeps or paravanes, H.E. bombs (500, 2,000 and 4,000 lb.), hydrogen retorts, mechanical tank parts, mines (various marks), mooring buoys, Mulberry harbour parts, parachute-type mines, pre-fabricated ship parts, pressed plate water tanks, shell racks for merchant ships, silicol hydrogen plants, tank landing craft parts, water supply tanks and structures.

All this work occupied a considerable amount of time, but there still remained a margin of usuable time which would normally be regarded as "leisure time," but which, under war conditions, was put to better purpose. Many employees, as well as members of the staff and management, voluntarily devoted their "leisure time" to Civil Defence duty and other equally important services. Much efficient part-time duty was performed in all ranks of the local authority Civil Defence services, and also in the Air Training Corps, Home Guard, National Fire Service, &c., by the Company's personnel, who also interested themselves in National Savings work and work for the British Red Cross Society, while many were regular blood donors under the Ministry of Health Scheme. An internal works scheme, comprising Civil Defence and fire-fighting organizations, was effectively maintained, as well as a works Company of the Home Guard.

There were many times when work was interrupted owing to the visitations of the enemy, the damage suffered from indirect action on one occasion being even greater in extent than that from direct action on an earlier occasion. However, it was not long before full production was resumed in each instance. Adequate shelter accommodation had been provided at the outset, and no fatalities were sustained within the works or offices. A senior draughtsman was killed by high explosive while sheltering at his home outside the City during an enemy air raid.

Normal manufacture is once more proceeding apace, and efforts are being made in every department to make up the leeway caused by the war.

# Presidential Address, North British Association*

By T. S. LOCKHART,
Rothesay

THERE are few of us who would not endorse the principle that the winning of coal must be organized as a national service for the common good of those employed and of the country they they serve. It is an unfortunate fact that political and psychological factors have intruded into what is essentially a technological problem; but it is a fact which must be recognized. I was always a firm believer in trying to lift coal problems out of politics altogether, but as nationalization has been practically decided upon here, too, we should wish it well, trusting that reorganization will result in increased technical efficiency, as well as in more contented service and a relatively cheaper product.

I am convinced that coal should be priced on a pure coal basis, and that, as far as technically and economically practicable, cleaning should be done at the colliery. This is of particular importance to an undertaking like ours at Rothesay, where transport charges form so high a proportion of cost into works. Each additional 1% of inert matter delivered to Rothesay costs us £226 per annum, and if it rises by an additional 5% it means that six more boat-loads are required merely for the more than useless transport of ash to Rothesay. The additional freight, unloading charges, increased cost and decreased revenue from gas and coke would probably represent an overall loss of £1,500 per annum.

Perhaps the most alarming factor in the situation is that actually less coal was mined in 1945 than the average annual home consumption for the war years without any allowance for export. Such a position can only mean that Britain may have to abandon coal exports altogether, and even have to resort to the import of coal to satisfy her own requirements. Certainly it would seem to be a very bad economic policy to revert to the heavy export of raw coal upon which relatively little labour has been expended, to the detriment of the carbonizing industries in which much labour is profitably employed, and from which emanate so many valuable by-products.

In short, to plan for the future prosperity and economic stability of our country without first ensuring the wisest use of our most essential and quite irreplaceable asset—coal—is to court failure and disappointment.

But to revert to our own problems; in Rothesay we have always pursued a policy of the maximum domestic use of gas, for space heating, water heating, cooking, home laundry and refrigeration. In pursuance of this policy, we have kept in the closest touch with house builders and plumbers, so that all householders and those administering to their needs may be aware of the comfort and saving of labour which is at their disposal. With the resumption of house building we have prepared a strenuous campaign, and immediately the controls and embargoes are lifted from the purchase of appliances we shall go ahead. We welcome the encouraging gesture of the Chancellor of the Exchequer in relieving gas cookers, fires, water-heaters, &c., from purchase tax, and we propose to offer these on a well-planned hire-purchase scheme. The returning Service men and women will welcome the opportunity of the immediate enjoyment of the higher standard of comfort which is assured by the use of modern gas appliances.

## Gas for the New Homes

The next decade will certainly see far-reaching developments in the design of the home and its heating and cooking appliances. The outstanding advance is the introduction of the non-aerated (or "neat") gas burner. The "Bunsen" burner served the Gas Industry remarkably well in its day and generation, but the present-day composition of town gas renders it possible to supply all the air necessary for complete combustion at the burner, obviating the noise, particularly when less than full-on, and the risk of those slight explosions at ignition and extinction which are such objectionable features of the "Bunsen" burner. The appearance of the flame, as seen in the boiling ring with the new burner, is particularly pleasing. It may well be called "The flame of the future."

The new cookers, which are now coming into production, are also a great advance on the old black cooker. There are already eight or nine gas cookers in this country to every one electric cooker, and with the disappearance of the black cooker and the improvement now developed we should improve even on this position. Every endeavour should be made to install cookers of the highest grade—one can even foresee an "all-glass" appliance. With regard to heat regulation, my own view is that this should be graduated and marked in degrees of temperature, rather than by arbitrary signs, such as No. 1, 2, 3, &c. To incorporate the oven thermometer might also be considered.

Of the gas fire I should say that there is an evergrowing demand for artistic and pleasing designs, giving ease of regulation with absence of noise. Sales staffs should not fail to emphasize the features of the new gas fires which, besides being an ornament to the room, provide efficient ventilation by assuring a definite freshening of the atmosphere at the rate of three or four changes per hour. With its low maintenance cost, its ease of manipulation and its entire abolition of dust and labour, the gas fire should, if gas prices are reasonable, continue to extend its hold on the space-heating load. The automatic ignition of the gas fire and other appliances is a problem which still awaits a satisfactory solution. The flint and steel cannot be said to be an elegant solution. The perfect catalyst has not yet appeared. In the meantime, something further might be done with hot wire connected to a dry battery or even to the electricity supply.

A constant supply of hot water on tap has become a necessity of modern life, and I believe that water heating will become the sheet-anchor of the Gas Industry. It is a load that will be spread over the whole 24 hours. The choice, in the first instance, of the correct appliance for the job to ensure the customer's complete satisfaction from the beginning is a matter which should receive very careful consideration.

## Industrial Gas

Innovations, both in the use of materials and methods of manufacture, have been so numerous during the war years that it is difficult to foresee the full extent of the possibilities which have been opened out in the use of gas in industry. But we can discern the future sufficiently clearly to say emphatically that the next decade will present an ever-widening opportunity which will completely offset the loss of loads for lighting, and the losses we have suffered or are likely to suffer in the munitions industry. The list of industrial applications of town gas already exhibits a bewildering variety. Perhaps the development of the high-temperature furnace is the most noticeable advance, particularly with regard to design and construction. No longer are these furnaces built by the user, with no previous experience, but they are now designed by specialists on ordered scientific lines. Simplicity of temperature and atmosphere control continues to lead to an increase in the use of town gas in furnaces for heat treatment processes of all kinds. The ideal of precision heating is readily attainable. The correct application of the luminous flame and of surface combustion has been mainly responsible for the increased use of gas for metal melting or forging. In all these processes the reduction in the proportion of rejects and wasters often entirely compensates for a slight increase in actual fuel cost. But fuel cost is naturally the prime factor, and careful consideration of the tariff should be given in each individual case.

In Rothesay we have installed a wide range of appliances for bakers, cafés, restaurants, fish friers, and a variety of small trades, as well as central heating of churches, assembly halls, hotels, and other similar uses.

An instance of particular interest was the use of gas for heating the water for the public swimming-pool. In 1935, when the Town Council decided to embark on a scheme for a modern indoor swimming-pool and baths, the question of fuel was given very full and careful consideration. Costs were prepared for the use of coal, compared with that of gas, for the firing of the boilers. The estimated initial cost of the solid fuel boiler and equipment worked out at nearly 25% more than the complete gas-fired job, but the all-in running cost for the former was £470, as against £610 per annum for gas. It is interesting to note that the actual cost for the complete full year's working amounted to £607 8s. 3d. But I was able to convince the Council that the cleanliness, ease of operation and automatic control justified the higher running cost. Their wise decision has been upheld by ten years' satisfactory and trouble-free operation.

As the relative fuel costs may be of interest to others contemplating similar work I give the estimates prepared at the time:

FUEL COST (ANNUAL).

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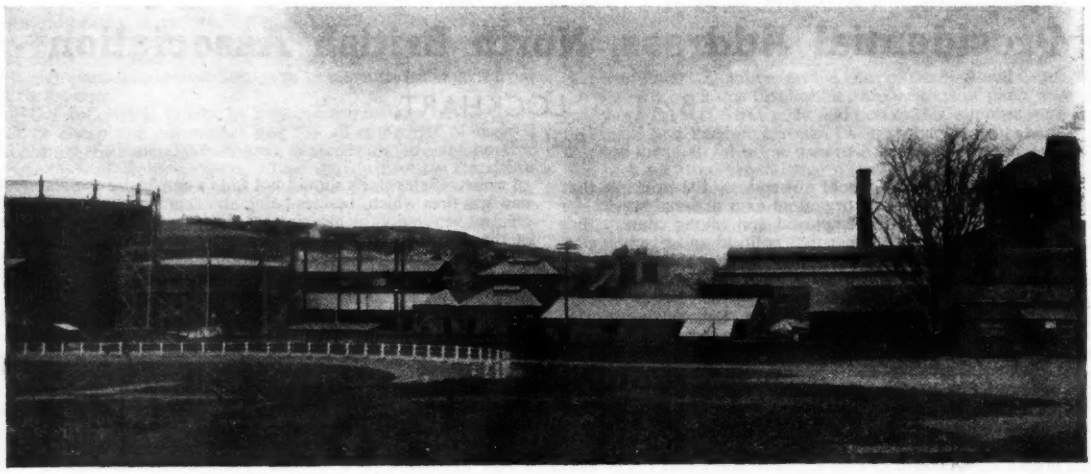
|---|---|---|---|
| Gas | £610 | Oil | £1,160 |
| Coal | £470 | Electricity | £1,780 |

The boilers, of the "Vesta" type, are fitted with automatic control, and the equipment includes the most modern cleansing and purifying apparatus.

## Coke

The past few years have shown us that there is ample room for all the solid smokeless fuel than can be produced, and the Solid Smokeless Fuel Federation is rendering outstanding service in uniting the interests of the producers of both gas-works and coke oven coke, in order to avoid the farcical competition which existed some years ago. The research work done by all concerned with smokeless fuels will pay

* Presented at the Spring Meeting at Coatbridge on Friday, April 12.



*General View of the Rothesay Gas-Works.*

handsome dividends in the future in the form of modern appliances. The research activities of the Technical Committees are becoming increasingly recognized, even in Government circles, and the present co-operation between the gas coke and coke oven research organizations make the future outlook a brighter one than it has ever been. If the coal, gas and electrical industries are to be nationalized, the Government must realize the necessity for an ever-widening use of solid smokeless fuels, both for national economy and for smoke abatement.

The coke position, as far as supplies were concerned during the past few winters, has been very difficult, and it looks as though the same conditions will persist for some years to come. The general shortage of coke in the country is mainly due to the necessity of gas undertakings making the maximum use of water gas in view of the coal shortage. The shortage thus created had severe repercussions on the market in some localities, as it took coke away from the normal consumers, who may have to be re-educated in its use. In Rothesay we have endeavoured, with some success, to maintain an even keel in respect of coke supplies by seeing to it that all our local coke requirements were adequately met, and by making water gas only with that coke which remained.

For the past many years we have kept in touch with architects, builders, and the housing authorities to place before them all the latest information regarding the development of smokeless fuel appliances, to ensure they were kept abreast with the latest improvements and advantages to be derived by smokeless fuel-burning installations.

## Tar and Benzole

Apart from the many chemicals extracted from tar, we must not forget its magnificent war service not only on the roads of this country, but also for countless aerodrome runways, both here and on the Continent, for the Admiralty, War Office and Air Ministry. The experience gained in these fields will be of vital importance to the wider development of road tar for these and similar purposes. I think the future for tar has very good prospects, certainly for a long time to come, in view of the immense amount of road repair work now to be done, as well as the general replacement of stocks of coal-tar derivatives depleted through war years.

Careful survey is being carried out in regard to the tar products requirements of the plastics industry, and for a wider use of pitch and allied materials in the building trades. In my opinion the sphere of research in respect of coal tar is immense, and probably larger than we realize. The new era of plastics has opened a very wide door, and it is to be hoped that rapid progress will be made in these developments to ensure that we shall hold our own in comparison with America in the plastics and other chemical industries.

During the past year the tar distilling industry has still been working under Government control. As these products were primarily for home consumption, this control started off with the objects of preventing the prices of products reaching abnormal heights under war conditions and of securing their proper allocation. An increase in price of certain products has been authorized, but it should be remembered that working costs have also increased. The requirements of the Government for war purposes and since the war for essential home uses have been met. The future of the tar distilling industry is obscure, since the proposed nationalization of the coal and gas industries would carry with it the ownership of the crude tar produced, and this position will require careful examination.

Faced with a European shortage of motor spirit I believe, too, that the prospects for benzole recovery are very good, and I have no doubt that the Government will continue its present policy of assistance in respect of those undertakings who have specially introduced plant and produced benzole during the war.

The fact should not be lost sight of that during the war years from 1939 to 1945 the British Gas Industry produced for the nation no less than 195 million gallons of crude benzole—an achievement upon which we can pride ourselves.

The experience thus gained during the past six years has been advantageous, and the war-time necessity of benzole production may become a peace-time virtue when normal coal supplies are again available. Discussions have been numerous as to whether or not benzole production pays. On this point plant manufacturers have been very helpful in giving expert advice on the subject, combined with wide practical experience, and in many works the question, after careful costing, can now be answered in the affirmative with a reasonable degree of certainty. Be this as it may, however, the tonnage of benzole which the Gas Industry supplied to the war effort must have been so decisive that no one would endeavour to express it in terms of profit or loss.

## Research

The initiation and progress of the Gas Research Board is an encouraging sign. It is understandable that much of its work is of a fundamental nature, not so much bearing on immediate problems as upon the future development of the Industry. The intermediate scale hydrogenation plant now working at Bournemouth is of this nature. It may result in a complete revolution in our manufacturing methods. The synthesis of methane is another line on which the industry may develop. The removal of organic sulphur from town gas is of more immediate importance. It is understood that plant is already in successful operation in which sulphur is reduced below the corrosion point at trifling cost. It is time that the slogan "Sulphur must go" gave place to "Sulphur has gone." Efforts are being put out in several other directions which will ultimately affect the manufacture and utilization of town gas.

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**The Fifty-First Annual Report** of Gibbons (Dudley) Ltd., presented at the annual meeting on April 3, showed a net profit for 1945, after providing for taxation and depreciation, of £34,267, which, added to the amount brought forward, made a total of £56,155. From this amount the full 7% Preference dividend, free of tax, for the year was paid on June 30 and Dec. 31, leaving £54,055, out of which £10,000 has been placed to reserve for deferred renewals and repairs, £5,000 to reserve fund (making a total of £75,000), and £3,343 to reserve for proposed employees' benefit funds (first contribution). A dividend of 10% on the Ordinary shares, plus a bonus of 5%, both less tax, was declared, leaving £21,780 to be carried forward.

**A Dividend of 10%**, less tax, has been declared by the Economic Gas Boiler Co., Ltd., for 1945. Trading profit for the year amounted to £7,972, out of which £4,500 has been transferred to taxation revenue account, and dividend payments leave a balance of £5,064 to be carried forward, against £4,916 brought in. Mr. R. Pilkington has joined the Board in place of Mr. H. Coates, who died last August, and Mr. T. Thornton, Secretary since the formation of the Company, has succeeded Mr. G. Pedley, who died in 1944, while still retaining the secretaryship. In his statement issued with the report and accounts, Mr. W. Pilkington, the Chairman, said the year under review had seen the revival of the normal business of manufacturing gas boilers and washing machines, although on a limited scale, and he considered the prospects for business were excellent in view of the demand for the Company's products, not only for replacements, but also on account of the new requirements arising from the Government housing programme.

# Midland Association of Gas Engineers and Managers

## Presidential Address*

of

GEO. P. MITCHELL,

Managing Director and Chief Engineer,
Worcester New Gas Light Company

THE District Associations have played an important part in the development of the Gas Industry, and the Midland Association has always been in the van of progress. There has always been good fellowship among our members which has rendered valuable assistance in the development of the undertakings. This has been made much easier, due to the broad-minded lead in such matters always available from our big brother—Birmingham. We owe that undertaking a great deal, and I should not like to miss this, our first opportunity at an annual meeting, of putting on record our deep appreciation of services rendered to the Gas Industry in general, and to the Midland Association in particular, by our old friend, Mr. A. W. Smith. We shall miss his cheery good humour and wise counsel, but hope he will enjoy his retirement in a way which he richly deserves. Without his wholehearted support it would not have been possible effectively to have brought into being the Midland Gas Engineering Advisory Board—the first of its kind in the Industry. I am not exaggerating I am sure when I assert that the Regional Advisory Boards have been more responsible than any other single factor for the maintenance of adequate gas supplies during the war period. We are gratified to know too that one of our members—a past President—is to be President this year of the Institution of Gas Engineers. We hope that Mr. G. C. Pearson will carry through his strenuous duties with enhanced credit to himself and the Midlands. My predecessor of two years ago—Mr. T. F. E. Rhead—initiated a scheme for a much closer association between the personnel of the Gas Industry and the University of Birmingham. I hope that everything possible will be done to implement his proposals.

This is the first meeting held under Peace conditions for some years. A year ago we were at war with both Germany and Japan. The whole nation had for years been keyed up to making the maximum effort. We had remained steady and kept our heads. Nevertheless, the strain of the past six years has left its effect. The whole of the national economy of production and of living has been put out of joint owing to the exigencies of war, and it will be impossible for the country apart from any foreign complications, to adjust itself to normality—whatever that may be—under a period of years. Hard work and deep thinking are required more to-day than in any previous period of our history. This holds whatever the complexion of the Government which, for the time being, may be in charge of our destinies. If every individual will put his shoulder to the wheel, it can have a greater effect than any regulation or legislation. Boys returning from the East, who have been away for some time, express surprise at the atmosphere of defeatism and frustration that is in evidence amongst so many.

### Major Change Overdue

Even if there had been no war a major change in the administration was beginning to show itself as overdue. Some thought the Gas Industry was a decaying Industry, and that electricity or oil were poising themselves to deliver the knockout. The war proved that the Industry was never more alive—and never more essential as an economic public service.

In the early part of last century, Murdoch and Watt introduced gas for public use purely as an illuminant—the intrinsic luminosity of the gas being its only marketable property. It probably had a calorific value exceeding 700 B.Th.U. per cu.ft., and had a growing popularity as compared with candles or oil. Later Bunsen devised his burner, by which, through pre-aeration, the flame temperature was increased—luminosity could be eliminated and smokiness prevented. It was not, however, until Welsbach brought out his rare earth mantle that these advances could be used for illumination. From that time on there was no technical necessity to provide intrinsically illuminating gas, although there were still a large number of flat flame burners in use up to the beginning of the twentieth century. In the early part of the nineteenth century medium and large size towns began to manufacture gas for public supply—for illuminating purposes—but it must not be overlooked that the population of England and Wales, when gas was first used for town purposes, was only about 11 millions, while in 1941 it was 40 millions. This meant that towns and villages were much smaller and more isolated.

Now that the population has increased and towns are bigger and nearer together, and the number of households using gas is such a high proportion of the total (and owing to the use of gas for all domestic heating purposes the amount of gas used per consumer is multiplied), it became manifest that gas could not be produced everywhere at the lowest cost and with the highest efficiency if the bulk of the gas undertakings continued to be self-contained and independent of one another. By implication this is well brought out in the Heyworth Report, which goes out whole-heartedly for ten large regional units of control. About the same time the new Government announce that they are to nationalize the Gas Industry—whatever that may mean. At least we know there are to be radical changes, and it would appear inevitable that the Industry will be regionalized and its finance be a Government concern.

### Education and Coal

There are two important revolutionary changes that will affect our Industry as well as all others. These are (1) National education; (2) the price of coal. Up to quite recent times a large proportion of the population could do little more than read or write. A small percentage of this class fought their way out and made good. From the rest, very largely, were drawn the stokers, miners, yardmen, furnace men, and others, whose working conditions were worse than the average.

Few to-day would deny the opportunity of equal educational facilities for all who can and wish to avail themselves of them, but it is inevitable that it will become more and more difficult to get labour to do the dirty jobs. This means more mechanization, new less laborious processes of manufacture and higher pay for the essential jobs that do not attract labour. The same thing applies in the home. When a better educated girl has a house to run, she will want all the labour-saving devices that are available, even at a slightly higher overall cost. This will create a still further demand for better types of solid fuel burning appliances. Of course, many will go over to gas or electricity, but I am firmly of the opinion that we should continue to look on our Industry as a two-fuel Industry, each being given equal attention as regards quality and appliances.

This brings me to my other point—coal. I cannot see the price of coal reverting to anything like pre-war prices. Fortunately for the Gas Industry, the price of coke follows that of coal, and if all industries are treated alike, the competitive position of the Gas Industry is improved by increases in the price of coal.

It is vitally important in the legislation that is now going through that individual industries and consumers should be protected against any possibility of differentiation in prices of coal, for political reasons, in order that the ability or necessity of one Industry should carry the costs of another. Coal of like quality and in like quantities should have the same pit-head price to all consumers.

### Coal Industry Bill

The Coal Industry Bill may soon become an Act. I, for one, hope that the Coal Board will be responsible direct to the Minister and not to the Ministry; that will mean that his advisers will be the Coal Board and not the civil servants. At the same time, in order to protect the nation against undue trade union or party influence, which may devise policies with political objectives, or for vested interests, I should like to think that the annual report of the Coal Board to the Minister should be independent and published, so that the public could be informed when differences occurred between the Board and the Minister on questions of policy which affected the economics of the Industry or the differential treatment of individual consumers.

It is conceivable that I should be expected to say something about the state of the Gas Industry to-day, with special reference to the Government's avowed intention to nationalize it, the existence of the Report of the British Gas Federation, and the proposals of the Heyworth Committee. For some time now many have been of the opinion that some form of re-orientation of the Gas Industry is desirable. While agreeing that many undertakings are as commercially efficient as can reasonably be expected under present-day conditions, there are many of all capacities that, to say the least, could do with an overhaul. There has been a marked tendency towards amalgamation and the development of holding companies, but the rate of such changes has been slow, and in some cases not without deserved criticism. It is therefore not surprising that we find both reports visualize the regionalization of the Industry. It is fairly certain, too, that unity of financial control will also be brought about. That of itself is of little significance; such a condition exists in all large undertakings. What matters is, will the income of shareholders be maintained, and the share holdings be no less negotiable, to say the least. Will the Industry be run on commercial and business-like lines?

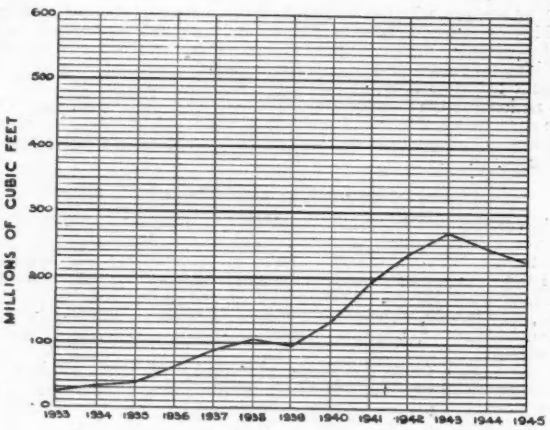
### Three Vital Interests

There are three vital interests concerned in the transactions: (1) The shareholders, who ought not to suffer; (2) the operatives, from the manager to the yardmen; and (3) the consumers.

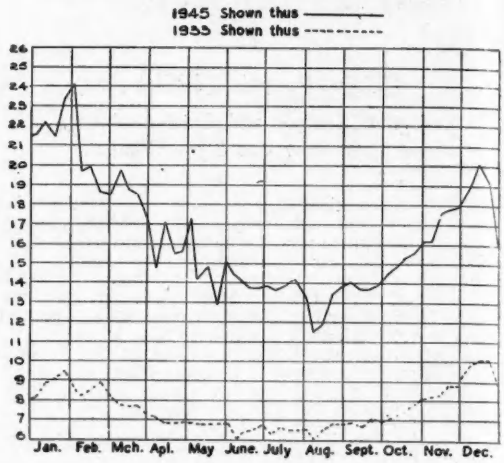
* Presented at the Annual Meeting at Birmingham, Mar. 28.

## WORCESTER NEW GAS LIGHT COMPANY

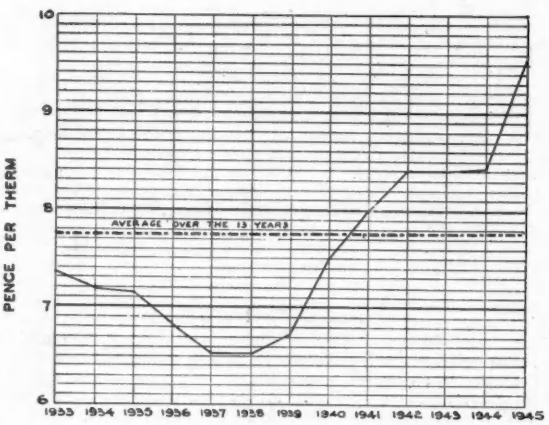
Comparative statistics showing the progress of the Company for the thirteen years (ending June 30), 1933 to 1945:—



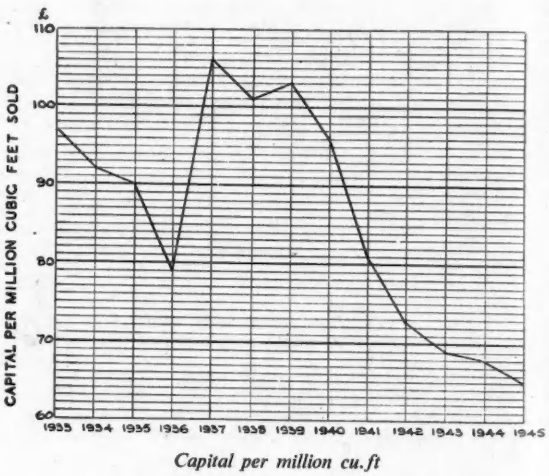

*Industrial sales.*



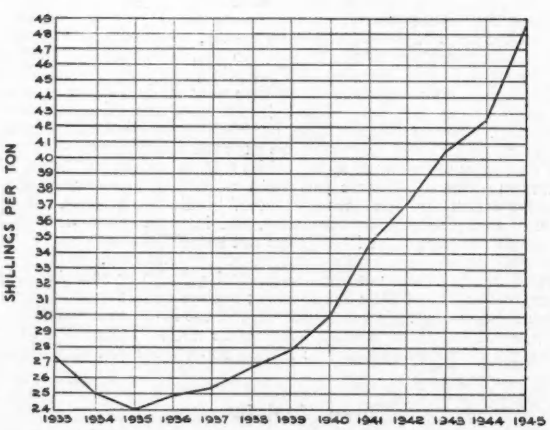

*Weekly output of gas.*




*Average price of gas.*




*Capital per million cu.ft*




*Cost of coal.*

| YEAR | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1933 | 387 | | | | | | | | | | | | |
| 1934 | 6.46 | 412 | | | | | | | | | | | |
| 1935 | 8.27 | 1.69 | 419 | | | | | | | | | | |
| 1936 | 22.74 | 15.29 | 13.59 | 475 | | | | | | | | | |
| 1937 | 36.43 | 29.18 | 26.81 | 11.15 | 528 | | | | | | | | |
| 1938 | 44.98 | 36.16 | 33.79 | 18.10 | 6.25 | 561 | | | | | | | |
| 1939 | 47.60 | 39.00 | 36.40 | 19.37 | 7.79 | (dec.) 2.31 | 548 | | | | | | |
| 1940 | 51.43 | 43.23 | 39.96 | 23.37 | 10.99 | 6.46 | 6.93 | 586 | | | | | |
| 1941 | 76.76 | 66.02 | 63.25 | 46.00 | 39.31 | 21.92 | 24.33 | 16.72 | 684 | | | | |
| 1942 | 95.09 | 83.25 | 80.19 | 63.95 | 63.00 | 46.15 | 37.77 | 38.96 | 10.38 | 755 | | | |
| 1943 | 106.72 | 94.17 | 90.93 | 68.63 | 51.51 | 42.66 | 45.99 | 36.52 | 14.96 | 3.96 | 800 | | |
| 1944 | 118.60 | 105.36 | 101.91 | 73.10 | 60.33 | 50.80 | 54.38 | 44.37 | 23.65 | 12.05 | 3.73 | 846 | |
| 1945 | 124.39 | 110.66 | 107.16 | 77.74 | 64.39 | 54.72 | 58.39 | 49.13 | 26.90 | 14.97 | 8.50 | 2.46 | 868 |

*Percentage increase in gas output.*

The Industry is a public service—almost a necessity. There is a rapidly growing appreciation of its importance—domestically, commercially and industrially—to the nation. The sole criterion of such a drastic change is that it shall result in a better service at the lowest cost. I believe that regionalization will do this if political influences are eliminated, and knowledgeable personnel are empowered to direct the Industry's affairs. I hope that during the coming months the whole question will be discussed openly, fully and candidly by all sides of the Industry, by the District Associations and by the national bodies. Such discussions will be of unquestioned service to the Industry and to the Minister. We all desire the same thing. We, as gas engineers and managers, have an unequalled contribution to make in the creation of the new structure. We must eliminate preconceived ideas, and apply our energies to the creation of the new organizations on the soundest possible lines, having for our sole objectives justice to the individual shareholder, good conditions, ample scope for the personnel, and still better service for the consumer.

## Worcester's Centenary

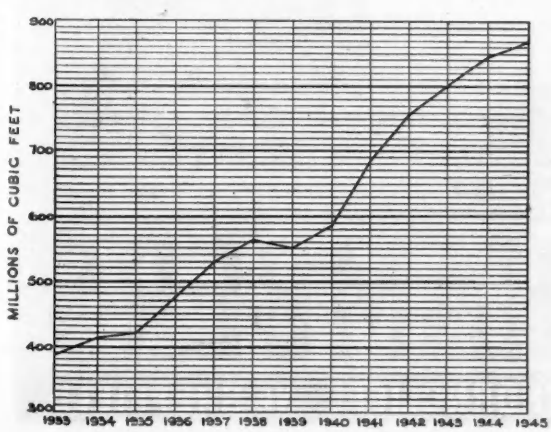
In conclusion I would like to say a few words about my Company, whose centenary we are celebrating this year. On April 7, 1818, a public meeting was held in the Guildhall, Worcester, when it was decided to form the Worcester Gas Company, and on June 5 of the same year an Act of Parliament was passed "For Lighting with Gas the City of Worcester."

The Company estalished its works on the site where they have stood ever since, conveniently bounded on the west by the Worcester and Birmingham Canal, which convenience was increased a few years later by the establishment of Shrub Hill Station, when the railway was brought to Worcester. There seemed, however, to have been widespread dissatisfaction with the quality of gas supplied, and also with the high rate charged—8s. 4d. per 1,000 cu.ft. Towards the middle of 1845 things reached a head, and on Oct. 17 of that year the Company appointed a sub-committee to consider whether to reduce their charges, or sell or lease their works to some public body or private individuals. There were three prospective purchasers—the City Council, the City Commissioners, and the present Company, the Worcester New Gas Light Company.

It was first offered to the City Council, but they abandoned the proposition; then the offer was made to the City Commissioners, who also declined it; whereupon the old Company opened negotiations with a provisional committee of the new company. After protracted negotiations, on July 16, 1846, there was passed an "Act for better supplying with Gas the City of Worcester and the suburbs thereof." By it, the Worcester New Gas Light Company became a corporate body, with a capital of £15,000, and was granted compulsory powers to purchase the works at a valuation. The price ultimately paid was £14,408, and Mr. Thomas Richards was appointed Manager and Engineer, having previously been Manager of the gas-works at Droitwich. The maximum price of gas was fixed at 6s. per 1,000 cu.ft.

Shortly after, the Manager reported that the retorts and other parts of the works were dilapidated and generally inadequate, and it was in 1848 that application was made for the Amending Act authorizing the raising of more capital. In 1852 the Company entered into an agreement with the Oxford, Worcester, and Wolverhampton Railway Company, now the Great Western Railway, for the lighting of the Railway Station at Shrub Hill, and this has continued ever since. For several years an animated debate had been flourishing in the City Council as to the advisability of the Council taking over the gas-works. The matter was officially broached to the Company during the summer of 1867, but evidently negotiations fell through.

The question of purchase was revived from time to time, but the situation became more complicated by the fact that the use of electricity for lighting was just beginning to be a practical possibility.




*Output of the gas for the thirteen years 1933 to 1945.*

This seemed to restrain their eagerness, and so allow the Company to continue its usefulness from then onwards. The Company has had to extend its works to meet not only existing wants, but probable requirements of years to come.

It will be readily understood, therefore, that it has not been an easy task to modernize and equip this undertaking to cope with an increase of 125% during the past 13 years. You will observe from the accompanying charts the growth of the Company, the annual output of gas, comparative weekly output, the cost of coal, and the average price per therm, during the period under review. To meet this position it has been necessary to introduce railway sidings, vertical retort installation of a capacity of 4½ million cu.ft. per day, complete with coal-handling plant, together with waste heat boilers, carburetted water gas plant, capacity 1½ million cu.ft. per day, also an activated carbon benzole recovery plant, having a capacity of 6 million cu.ft. per day, with additional subsidiary plant, such as condensers, exhausters, detarrers, static washers, purifiers, station meter, compressor plant, &c. Apart from the increased capital sought in 1848, which then stood at £34,000, no further application was made until 1936/1937, when £17,000 Debentures were raised.

While increased sales were obtained during the war period, it is only right to say that steady progress was being made in this direction prior to the war, and we hope that not only shall we retain our present load, but add to it. Not the least remarkable is the fact that we have over 30% of our total load on industrial rate, and given good service, I see no reason why any undertaking should not develop and increase this business in a like manner.

Finally, I cannot do better than quote you my final remarks from my Presidential Address to the Waverley Association in Edinburgh in 1934: "None of us can afford to neglect any opportunity of increasing our efficiency in every phase of our activities. If we do so, we shall inevitably be left behind, for our various competitors are ready to take immediate advantage of any failure on our part. But just as in the past we have, as an Industry, faced difficulties and created opportunities for ourselves, so to-day, despite fierce competition and difficult economic conditions, we can, by our individual and united efforts—and these I know will not be wanting—ensure that the future of the Industry to which we belong shall be even brighter and more useful than the past."

## A Further War Record

News of the difficulties under which so many manufacturers laboured during the war years and the dangers which beset them have—as far as manufacturers concerned with the Gas Industry go—been recorded in the "JOURNAL" as they have been disclosed. Among the latest accounts reaching us of blitz experiences is a report contained in the January Bulletin of Baird & Tatlock (London), Ltd., which describes how, despite several crippling blows, the firm succeeded in carrying on. The first of these occurred in September, 1940, when their original premises in St. Cross Street received a direct hit, the flames spreading to their new building next door, which housed offices, showrooms, laboratories, &c. As a result almost their entire stock of apparatus was destroyed. Only two weeks later the chemical warehouse belonging to a subsidiary company, Hopkin & Williams, Ltd., received two bombs, which destroyed the lower floors and ruined all chemical stocks. Another two weeks brought a fourth bomb which, landing in the same place as the first, did further damage and destroyed all the records kept in the basement. Extensive new premises acquired in the vicinity met with the same fate as their predecessors, and the warehouse and despatch departments were forced to move to Pinner, the administrative offices settling at Esher.

Incendiary bombs and V1 and V2's played their part in disorganizing things further, but throughout these calamities the factories remained virtually untouched, and gradually new stocks were built up. Even so, the ground lost during this period has not yet been completely regained.

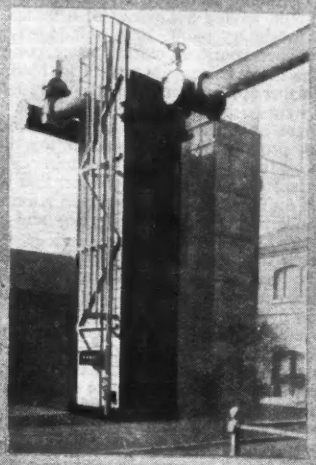
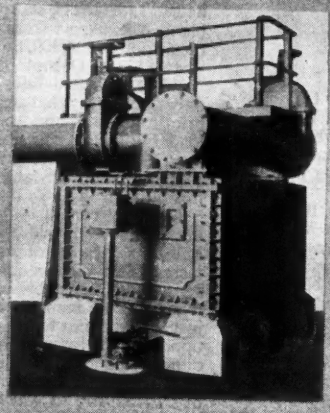
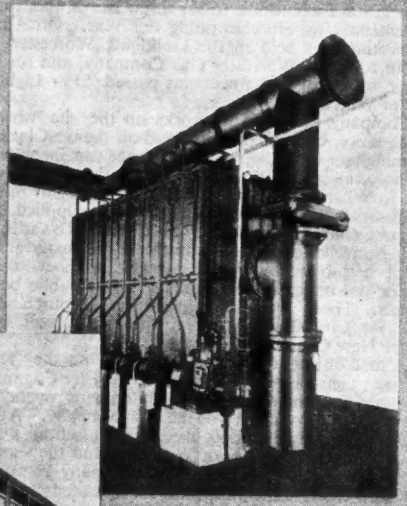
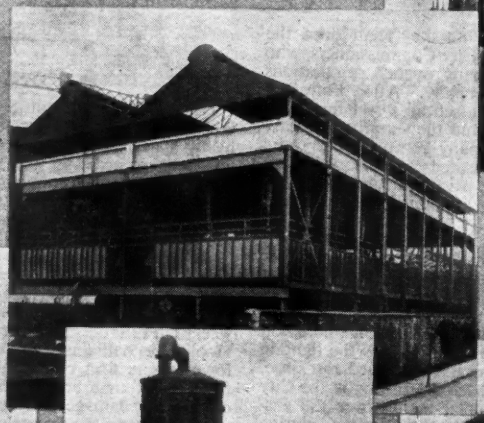
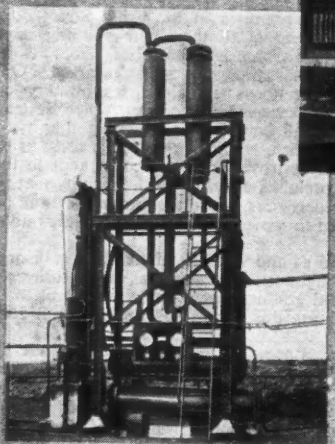
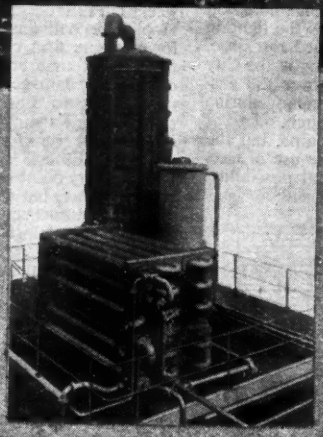
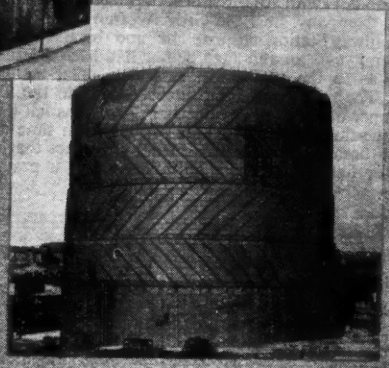
The Bulletin mentioned some of the contributions made by Baird & Tatlock, Ltd., to the war effort, including special equipment for midget submarines, high explosive bombs, and mobile laboratories. Of these last-named a separate account is given, together with photographs showing interiors. The laboratories were of many types—*e.g.*, Acoustics, Bacteriological, Biochemical, Building Research, Hygiene, Nutritional Survey, Oil and Petroleum Testing, Pest Control, Radar, and Soil Mechanics. They embodied many ingenious devices for ensuring the safe transit of extremely fragile apparatus.

The story is yet another of British resourcefulness—a record of which the firm may well be proud.

**Gas Rationing Regulations** would soon disappear if coal were of normal gasmaking quality, said the Rt. Hon. James MacMahon, Chairman, at the half-yearly meeting of the Alliance and Dublin Consumers Gas Company. The undertaking was at present living "from hand to mouth" in securing coal supplies. Much-needed repairs and renewals had been effected and the undertaking was less vulnerable to calamity than before. These improvements had enabled the Company to manufacture a greater quantity of gas than at any time for several years past.

# GAS WORKS PLANT

NC

# NEWTON CHAMBERS

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# Domestic Gas Cookers—Design of the Hotplate

The following discussion took place on the Paper on "Domestic Gas Cookers—Design of the Hotplate" which Mr. **E. W. B. Dunning** (Watson House, Gas Light and Coke Company) presented at a meeting of the London and Southern District Junior Gas Association on March 8. A summary of the Paper was published in the "JOURNAL" of April 10 (p. 594).

Mr. **F. C. Smith** (Gas Light and Coke Company) said that on such a subject one was faced with a large number of variables, and it was surprising how many people had failed to separate them, and therefore to assess their relative importance to each other. The Author had, however, been able to achieve what others had failed to do. His attack had been scientific, and he had not fallen into the error of losing sight of the practical aspects. He had kept in view the severely practical side. His only suggestion was that Mr. Dunning might adopt another form of graph, plotting the B.Th.U. required to do a given piece of work against the gas rate.

Mr. **F. Lake** (Radiation, Ltd.) said the appliance manufacturing side of the Industry was indebted to Watson House for undertaking the type of work that had been described. Very few consumers had any dea of the experimental work that lay behind their appliances; they usually took it all for granted. Boiling burners should not only have good thermal efficiency, but should have good heat spread. The hotplate should be reasonably easy to clean, and it must have eye appeal. To satisfy all these requirements some compromise was usually necessary, often at the expense of simplicity and of the maximum efficiency of the original conception. The appliance side of the Industry was well aware of the requirements, and also the snags. The Author's retort to that remark would probably be, "Well, what about it?", to which he could only reply, "You'll see!"

Mr. **L. T. Minchin** (Gas Light and Coke Company) said the striking thing in the Paper was the importance now attached to turn-down conditions. In common with many other men he had had rather more experience in the kitchen during the war, and had realized how extremely important was the behaviour of boiling rings when turned down low. He was rather surprised that simmering burners were made smaller than boiling burners, and he thought they ought to be at least as large. He had been investigating the stability of burners turned down, and had prepared a graph (which he displayed on the screen) showing the effects of reduced gas rate.

## Crusade Becomes An Urge

Mr. **R. F. Hayman** (Gas Light and Coke Company) said when the Author and he gave their joint Paper in 1938 they little thought that eight years would elapse before this complementary Paper was given. One of their colleagues who did a lot of work on the subject was Mr. Purkiss, who had been in Australia for some years, and he was glad to welcome him back that evening for the sequel to the work in which he had participated. In those days the effort to get appliances that were clean, attractive to look at, and efficient, was a crusade, and it was with gratification that they saw, in spite of the years of overstrain, a considerable advance. That crusade had become an urge, shared by manufacturers, designers, and users alike, and the Author should have his full share of credit for all that he had done in fostering that urge.

Mr. **F. Holland** (North Middlesex Gas Company) said there was a big saving of gas in boiling a kettle for a longer period on a small amount of gas. He asked whether the efficiency of a round grill was as high as that of the oblong type.

Mr. **D. M. Holloway** (Parkinson Stove Co.) said the standard referred to in the Paper as having been almost adopted by the British Standards Institution allowed for the heat absorbed by the water equivalent of the vessel as well as that absorbed by the water. The Author had said that a finned base kettle gave 30% higher efficiency than a plain base vessel. That was based on two results, in both of which the water equivalent had been credited. That was quite a correct observation regarding the amount of heat transfer through the base of the vessel. The Author had suggested that that could be used to justify an increased price for the kettle, but he was inclined to disagree with him, because the housewife did not credit the water equivalent in the vessel. What mattered to the user was purely the amount of heat in the water. Compared with a standard vessel the efficiency was only 15% better, and if one compared it with the ordinary sort of tin kettle it was only 12% better. In dealing with the design of vessel support, Mr. Dunning had referred to the effect of bars on the heat transfer area. If the effect was conduction of the heat away from the vessel, then the loss was likely to be greater with a larger vessel, but if the effect was obstruction, the loss would be less the larger the vessel.

The **President** (Mr. L. W. Andrew) observed that the finned base kettle was rather heavier than the conventional kettle. In his own home it was usual to fill the kettle by weight, and he wondered whether the difference in weight would make it more difficult to estimate the amount of water put into it. Would a solid hotplate with a larger number of smaller holes help to get over the question of the structure of the base of the vessel? He had been impressed with the ease of ignition demonstrated by Mr. Dunning during the presentation of the Paper, and wondered whether he attached importance to the elimination of the match from the domestic kitchen.

Mr. **Adam** (R. & A. Main, Ltd.) referred to the effect of a screen round a boiling burner, and thought further work could be done on that matter with advantage. When a screen was placed round a burner a chimney effect was created, and excess secondary air was sucked up, but with proper precautions it was possible to raise the efficiency in that way. Had the Author had any experience of sheet metal bars? He personally thought they might be used to raise the efficiency.

## Scope for Improvement

Mr. **G. C. Holliday** (Gas Light and Coke Company) said the Paper showed scope for improvement in efficiency. They must aim at getting higher efficiencies and lower running costs for the housewife. He stressed the importance of educating the consumer. That was a matter the Industry was taking up very seriously at the moment, as it was important that the consumer should be taught the best methods of using appliances and helped to save gas.

Mr. **A. E. Livett** (Gas Light and Coke Company) said men were mostly concerned in saving gas, but they would like to hear the woman's point of view as to what she wanted in the way of a cooker.

Mrs. **Lea** (Ministry of Fuel and Power) said she was especially interested in fuel efficiency, and she thought the Paper was very interesting and gratifying from that point of view. Whenever she visited Watson House she came away with feelings of enthusiasm, but on Sundays she cleaned her gas cooker, and did not then take such a favourable view of things. She thought it would be a great help if there was some easier method of cleaning up after things had boiled over, and one thing she always felt would help was to have a cooker with a lighter top surface. If they could have grey or white bars instead of black they would be able to see the dirt and clean it off before it accumulated.

Mr. **A. Forshaw** (R. & A. Main, Ltd.), speaking from 37 years' experience of the appliance manufacturing side of the Industry, said they had been in the habit in their laboratories of assessing the value of burners in terms of thermal efficiency. That was perhaps not the best possible way of finding out the merits of a burner. They should correlate time with efficiency, and if a formula for that purpose could be devised it would be very helpful. He also urged the desirability of a standard gas unit of, say, 4,000 B.Th.U. to popularize gas as against electricity, with which it was in competition for the cooking load.

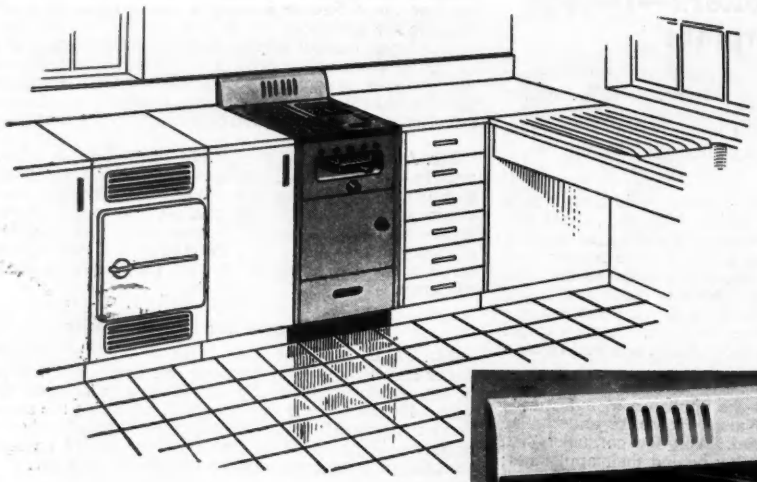
Miss **Gobley** (Gas Light and Coke Company) strongly advocated automatic hotplate ignition. In her opinion there could be no greater boon than to be able to light a burner with one hand, instead of two.

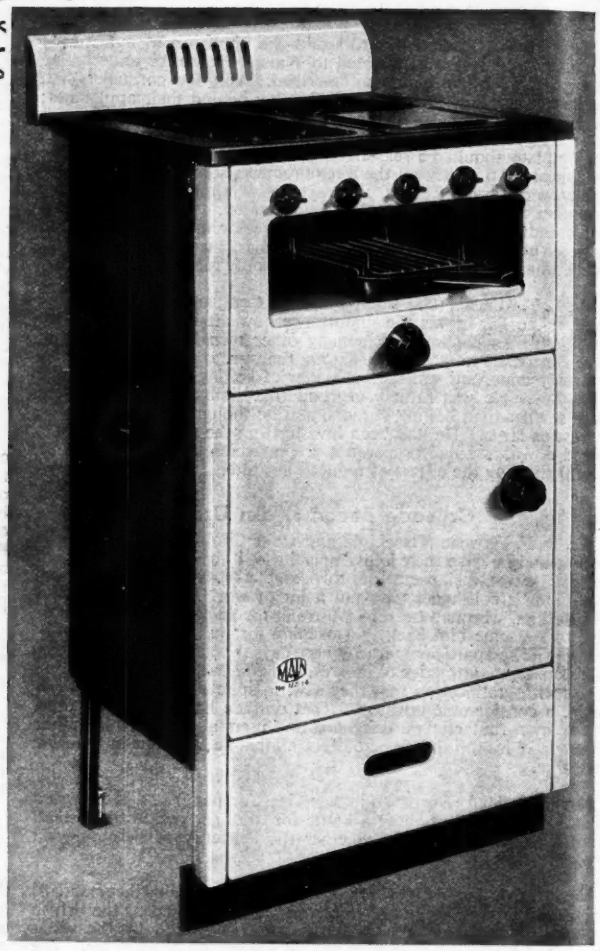
Dr. **Jessel** (Ascot Gas Water Heaters, Ltd.) said he had been surprised to find that the trend of development was in the direction of the solid hotplate. In dealing with electric cookers the general tendency was to decry the solid hotplate and to favour the radiant type. If the solid hotplate was not good for the electric cooker, how could it be good for the gas cooker?

## The Author's Reply

Mr. **Dunning**, replying to the discussion, said he had taken note of the suggestions made by Mr. Smith and Mr. Forshaw with regard to different graphs. He had shown all his graphs in the same form—efficiencies on one side and the other factors on the other—so that all the results could be read on the same scale. In answer to Mr. Lake, he looked forward to seeing the improvements which he was bringing along, and hoped he would have to extend his graphs to accommodate the additional results that would be obtained. He felt that manufacturers as a whole had not paid sufficient attention to ease of cleaning, and had paid rather too much attention to eye appeal. Consumers could be easily sold something, but they had to remain sold, and there was a point at which ease of cleaning came before increase in efficiency. Reference had been made to boiling water at a low gas rate. They might get higher efficiency by reducing the rate, but the rate could be reduced too far, and they could get to a point where the heat loss from the sides of the vessel would outweigh the increased heat transfer to the base. Mr. Holland appeared to have overlooked his reference to a circular grill.

One or two points about thermal efficiency had been raised by Mr. Holloway. Actually he had given net as well as gross efficiencies. Compared with light tinplate kettles the finned base kettle did not show up to advantage, but the former quickly rusted out, and compared with good quality aluminium kettles there was a considerable saving. With regard to the question whether bars affected heat





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## The 177-14 GAS COOKER

*(INSET TYPE)*

transfer by obstruction or conduction, he felt this was a problem still to be settled experimentally, and they would carry out some tests on that matter. The one great advantage in giving this Paper was that he had learned a lot more about the subject and discovered avenues for further research work. Answering the President's question about the difficulty of estimating the contents of the heavier kettle, he pointed out that the natural tendency would be to put in less water, and therefore the boiling of the kettle would be more efficient.

With regard to the solid hotplate, although they had developed it as far as they had, they did not want to use machined-based vessels, and they were suggesting that developments should take place along the line of having a radiant plate. The chief point about the solid hotplate was ease of cleaning, and they were surprised that they got so high an efficiency as they did. They had carried out most of their tests on the spreading-flame burner, but there was still a lot of work to be done. With regard to sheet metal hotplate bars, they wanted to carry out an investigation because there was no doubt that they would become increasingly popular. Both they and their consumers would like light metal hotplates, provided they were technically satisfactory. With regard to electrical competition, he had avoided comparisons because the Paper was already long, and it would take a long time to cover that subject. On the question of boiling over, they felt it best to let anything that boiled over drop through to the crown tray, where it was collected and cleaned up easily. Light colours had been tried for the tops of cookers, but people had said that while black ones were difficult to clean, light ones were even worse. When they had succeeded in making hotplates easier to clean they would proceed to the introduction of light colours. There was a lot to be said for the gas unit advocated by Mr. Forshaw, but the electrical people had also had a lot to say about having a unit more easily capable of variation to compete with gas.

On the motion of Mr. **R. J. Pepper** (Gas Light and Coke Company), seconded by Mr. **Pritchard** (Tottenham), a hearty vote of thanks was accorded to Mr. Dunning, who briefly replied.

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*COMPANY MEETING*

## Glover & Main, Ltd.

The annual general meeting of Glover & Main, Ltd., was held in London on April 10. In his statement Sir ERNEST HILEY, the Chairman, said:

It is with great regret I have to report that Mr. Sydney Wood, who had served as a Director since 1929, has passed away. He died shortly after our last meeting, at which he was present. We have lost a genial friend and a man of shrewd judgment, particularly in financial affairs. We have also suffered another loss by the death of Mr. James A. Maclay, who spent his whole life in the work of the Company; indeed, he completed 60 years' service. He was appointed a Director in 1920 and for 25 years was our Sales Director. He was very well known and respected in the gas world, and did much to assist this Company. He was a remarkably pleasant man to work with and a loyal colleague, and we shall miss him sadly.

I am glad to say Mr. Peter Aird has obtained his release from the Army. We are thankful that he has come back safe after hard experiences and heavy fighting. We have appointed him Sales Director, and he has entered on his work with hereditary zeal and enthusiasm.

As this is the first meeting of the Company since the conclusion of war, I think you would wish me to give a short account of our activities during the period of hostilities. It was not until the second year of war that we began to be reasonably occupied; but from thence until the conclusion of hostilities we were required to devote our whole attention to the output of important munitions and, indeed, some of the orders have only just been completed. That we turned out good work and justified the confidence reposed in us is evident from the fact that we received letters of appreciation from Ministers, and repeat orders.

To give a list of the various things we have produced would be pointless and dreary. It will suffice to say that we produced munitions and equipment for every branch of the fighting forces, ranging from ammunition boxes and the detailed intricacies of the torpedo bomb to insecticide sprayers for the troops in Burma. Our works at Falkirk were not interfered with by enemy action, but our establishments at Edmonton, Croydon, Bristol, Belfast, and the head office at Grosvenor Gardens suffered from all sorts of missiles, and were damaged on 15 separate occasions. Fortunately, although the material damage was extensive, there was only one person killed and four injured, but these various attacks interfered with the output from the works. In addition to doing war work proper, we were called upon to assist agriculture at home, and we constructed a large quantity of ploughshares, and in this way we made due contribution to the production of food.

Moreover, the large munition and aircraft factories had to be equipped with canteens and kitchens for the use of their workpeople, and as this was a branch of our peacetime avocation, we were glad to be entrusted with the installations at Coventry, Derby and Glasgow, together with much useful work in hospitals, railway stations, school kitchens and British Restaurants.

When all have done so well, it is difficult to commend anyone in particular, but mention should be made of the Managers of the four works, Mr. Wortley, Mr. Marley, Mr. Wilson, and Mr. Chapman, whose ability, skill, and devotion it is difficult to praise too highly. It is to be regretted that only one recognition of an individual in the Honours List has so far been made, but we must congratulate Mr. George Reid of the Falkirk Works on the bestowal of the B.E.M., and the award of the D.S.M. to Mr. Alex Kiddie of the Edmonton Works.

The number of our employees called up to the Forces was 621, of whom, alas, 33 were killed; the survivors have all expressed a desire to return to the employment they had with the Company before the war, and are slowly resuming their former places. A suitable bronze tablet will be installed at each works setting out the names of the fallen and the names of those who served, and to mark the Company's appreciation of the loyalty and hard work of the workpeople, we propose to make a substantial contribution to funds at each works, for the encouragement and extension of social and recreational facilities.

I am glad to say that our works at Falkirk and Croydon, and also the establishment of Thomas Glover & Company, have been fully occupied during the past year, but R. & A. Main have been handicapped at Edmonton by the dislocation caused through the two bombs that fell on the works in January, 1945. The damage done was very extensive, and it took a long time to clear up the wreckage. We seized the opportunity of commencing the work of reconstruction, which is imperatively necessary if we are to cope with our anticipated post-war production. Owing to the shortage of man-power we have determined to mechanize part of the foundry at Edmonton, and a start has been made with this work, but the delays and restrictions of the various Government departments have seriously handicapped us, and it will not be possible to use the new plant before October. The cost will be considerable, but we have made provision for it in the reconstruction reserve that we have set aside and are beginning to utilize. We are glad to be able to recommend the same rate of dividend as was declared last year and a distribution of a like bonus.

Our prospects for the present year are good. The orders put a strain upon us, but if the Government would assist us to get further man-power we should be able to fulfil the many orders we have from them for cookers, meters and water heaters for the new houses, and be able to give greater satisfaction to our own customers who have waited so patiently.

The requirements of the export trade have received our attention, and we wish we could do more to gratify the aims of the Government in this respect, but we find that they are not very helpful and we are checked at every turn. We have had the greatest difficulty in obtaining permission to send parts of meters to our Dutch factory in Amsterdam, and we have had to allow other enquiries to go unsatisfied. It is a truism to say that the revival of the national prosperity depends on the expansion of our export trade, and we shall get no relief from the heavy burden of taxation and the expense involved in the Government's scheme for social security until we are able to produce more. Wages are on the upgrade and there is a demand for shorter hours, and all these factors will increase our expenditure, and defer the day when we can offer to the public what we sincerely wish to do, namely, a cheap cooker on superior lines.

I am not a pessimist, but it is impossible for anyone to avoid anxiety at the present time. The general uneasiness infects everyone. The nationalization of the Gas Industry may affect our trade and have unexpected reactions. It is, therefore, satisfactory that our Company is in a very sound condition with ample liquid resources, and we have increased our provision to cover the expense of reconstruction of the various works and renewal of the Company's activities. We are not at all dismayed by the difficulties of the times, and we look forward to the future with confidence.

It only remains for me to report that our whole organization, whether in the management, the offices, or the works, has rendered loyal and good service during the year, and it is right that we should give to each member hearty thanks for his or her hard work and attention to duty.

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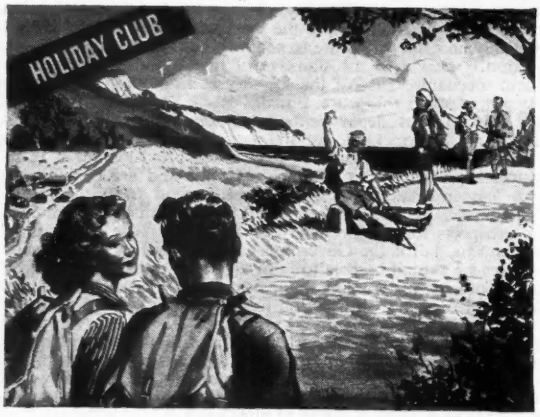
**The Dunfermline Branch of the Women's Gas Council** held its annual meeting in the Gas Showrooms on March 28, Police Judge Miss M. Frew, M.B.E., presiding. The report on the year's activities and the financial statement were considered satisfactory. Mrs. D. T. Kennedy was appointed President, with Miss Frew as Vice-President, and Miss I. Herd, Hon. Secretary and Treasurer. A garden fête is to be held on June 1.

**The Bradford Gas Department Staff** held their annual dinner (the first since 1939) on Mar. 19, the occasion being marked by a welcome to all members of the staff returned from the Forces, on whose behalf Mr. W. W. Snowden responded. Among the guests were the Chairman of the Gas Committee (Mr. J. Cariss) and Mrs. Cariss, the Deputy Chairman (Mr. E. England) and Mrs. England, and Mr. and Mrs. Charles Wood. The chairman of the proceedings was Mr. G. E. Currier, Engineer and Manager. The dinner was followed by dancing, whist, and musical items by members of the staff.

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# GAS PRODUCTS PRICES—STOCKS AND SHARES

### The London Market April 15.

There are no changes to report in the prices of Coal Tar products, the majority of which are controlled either by Government Order or by agreements.

The following are controlled by Government Orders at the prices indicated:—

Road tar at 5½d. per gallon filled into buyers' tanks at sellers' works, with corresponding prices when delivered and when supplied in packages.

The price sprayed direct on to roads is controlled by agreement and is 8½d. per gallon for full tank loads in London and adjacent counties.

Creosote for hydrogenation is based on 5.875d. per gallon and creosote for timber preservation on 5½d. per gallon *ex* sellers' works, with the usual extras for different qualities, packages, &c.

The basic price for cresylic acid is 3s. 6d. to 5s. per gallon, according to grade.

Hot pressed naphthalene costs £11 11s. in bulk *ex* distillers' works. Prices for refined naphthalene vary from £20 15s. per ton for crystal on 50-ton contracts to £26 15s. per ton for ball and flake. These prices are delivered England and Wales in 2-cwt. bags, minimum 4-ton lots.

The maximum prices for coal tar naphtha vary from 1s. 11d. to 2s. 11d. per gallon and for xylol from 3s. 3½d. to 3s. 6d. per gallon delivered buyers' address in minimum 1,000-gallon lots in bulk. The maximum price for pure toluene is 3s. 2¼d. per gallon in bulk *ex* sellers' works.

The following prices are controlled by agreements:—

Pitch for briquetting is 70s. per ton *ex* sellers' works in bulk.

Phenol is 9½d. to 11½d. per lb. in large returnable drums delivered buyers' address, according to quantity.

### The Provinces April 15.

The average prices of gas-works products during the week were: Pitch, 70s. per ton; toluole, naked, North, 90's, 2s. 4d. to 2s. 6¾d. per gallon; pure, 3s. 2¼d. Prices for carbolic acid 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil are controlled by S. R. & O. 1943, 1538, and for naphthalene by S. R. & O. 1944, 1051. Prices for road tar were increased by a half-penny per gallon by S. R. & O. 1945, 229, under which Order there was also an increase of 5s. per ton in the price for standard creosote-pitch mixture.

The bulk of the pitch produced in this country is required for home trade purposes, but certain quantities are being sent at higher prices to Allied countries with the approval of the Coal Tar Control. So far as creosote is concerned the bulk is required for essential purposes, at controlled prices. With regard to hydrocarbon oils, the prices remain fixed, although there is more freedom than was previously the case.

### Scotland April 13.

Throughput is well maintained with prices firm. Refined tar*: Yield to the Distillers is 5d. per gallon *ex* Works, naked. Creosote oil: Timber preserving quality,* 5½d. to 6½d. Hydrogenation oil,* 5¾d.; low gravity or virgin oil,† 7½d. to 7¾d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha†: 7d. to 8d. per gallon. Solvent naphtha*: Basic maximum prices delivered in bulk, 90/160 grade, 2s. 10d., and 90/190 Heavy naphtha, Unrectified, 2s. 0½d.; Rectified, 2s. 4d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

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The Budget proposals, though modest, gave a stimulus to stock markets last week. The prices of gilt-edged stocks went further ahead, and at the outset some large gains took place among industrials. A fair amount of profit-taking was in evidence at one time, and this caused some reactions, but by the end of the week the tone was particularly strong again. The volume of business was 35% heavier than during the previous week.

The Gas market was also more active, although the big demand elsewhere overshadowed events in this section, and despite the increased amount of business it will be seen below that comparatively few quotations were changed. The majority of the movements, however, were in an upward direction, but again there were no special features.

**PROVINCIAL EXCHANGES**

| | | |
|---|---|---|
| Bristol 4 p.c. 1st Deb. | 102½—104½ | +1½ |
| Ditto 2nd Deb. | 101½—103½ | +1 |
| Newcastle Ord. | 23/9—24/9 | —/3d. |
| Sheffield Cons. | 128—133 | —2 |

**OFFICIAL LIST**

| | | |
|---|---|---|
| Alliance & Dublin Ord. | 121—126 | +1 |
| Bombay | 40/6—42/6 | —/6d. |
| Bournemouth 4 p.c. Deb. | 102—107 | +1 |
| Commercial Ord. | 65—68 | —1 |
| Croydon Sliding Scale | 119—124 | +1 |
| Gas Light 3½ p.c. max. | 85—90 | +2 |
| Ditto 3 p.c. Deb. | 92—95 | +1 |
| Primitiva Holdings Ord. | 12/—13/— | +/3d. |
| South Metropolitan Ord. | 91½—94½ | +1½ |

CORRECTION.—The Malta and Mediterranean *x.d.* price quoted in the "JOURNAL" of April 10 referred to the Company's 7% Non-Cumulative First Preference Stock.

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